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THE FURTHER DEVELOPMENT OF RESEARCH COMPETENCIES OF PERSONNEL IN VOCATIONAL EDUCATION RESEARCH AND DEVELOPMENT.

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SIX 1-WEEK SEMINARS WERE HELD TO DEVELOP INCREASED RESEARCH KNOWLEDGES, COMPETENCIES, AND INTERESTS OF INDIVIDUALS INVOLVED IN RESEARCH IN VOCATIONAL EDUCATION. THE SEMINARS DEALT WITH THE PROBLEM AREAS OF (1) DEVELOPMENT AND COORDINATION OF RESEARCH BY STATE RESEARCH COORDINATING UNITS, (2) CURRICULUM DEVELOPMENT, (3) TESTS AND MEASUREMENT, (4) OCCUPATIONAL MOBILITY AND MIGRATION, (5) RESEARCH DESIGN, AND (6) CURRICULUM EVALUATION. FINDINGS IN THE EVALUATION OF THE SEMINARS STRONGLY SUPPORTED THE CONTINUATION OF RESEARCH SEMINAR PROGRAMS FOR VOCATIONAL EDUCATORS. (GD)

FINAL REPORT
Project No. ERD 444-65 (5-0164)
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U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
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August 1966

U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

Office of Education

Bureau of Research

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Project No. ERD 444-65
Contract No. OE-6-85-027

Charles W. Hill, Project Director
Douglas C. Towne, Research Associate

August 1966

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Cornell University

Ithaca, New York

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INTRODUCTION

Background of the Vocational Education Research Seminars

In 1961, the Research Committee of the American Vocational Association established as a major objective the development of research abilities of individuals engaged in, or otherwise interested in research. In this effort the Committee worked with research staff representing the several branches of vocational education in the U.S. Office of Education.

The situation at that time, as the Committee assessed it, was characterized by scarcity of well-qualified individuals to do research, by little interest to enter research, and by very limited or no funds available to support research projects. It was recognized that researchers in vocational education needed greater administrative and financial support. The Research Committee chose as its major objective the development within administrators, supervisors, teacher-educators and potential researchers of (1) a positive acceptance of a need for research and (2) the desire and ability to engage in research activities.

To achieve these objectives the Research Committee, in cooperation with personnel in the U.S. Office of Education and Purdue University, planned and conducted a one-week vocational education research seminar on research design in the spring of 1963. Attending were vocational educators from each branch of vocational education, representing every region in the United States. Dr. David Krathwohl of Michigan State University presented the major lectures.

The result of the seminar exceeded expectations. Participants were stimulated to continue the study of research methodology and statistics, and to become more actively engaged in vocational education research. This seminar tended to develop a favorable climate toward research. Important to note is the fact that all of those invited did attend, with expenses paid personally or by their states. The apparent success of the Purdue seminar indicated a definite need for continuing the effort.

In 1964 a series of three, one-week vocational education research seminars were initiated by the Research Committee and vocational education research personnel from the U.S. Office of Education, and were conducted by three universities. One seminar, at Pennsylvania State University, dealt with research design, with participants selected by the Research Committee. A second, with emphasis on the contribution of the social sciences to vocational education research, was conducted by the University of Illinois at Allerton House. Those attending the Purdue University seminar the previous year were invited to this one. A third seminar was held at Ohio State University for administrators of vocational education research. The purpose was to generate more interest, and to increase involvement on the part of state vocational education directors and of the various university department heads.

As in the previous year, the participants in the 1964 seminars were selected by the Research Committee and were invited by the host university. The participants (or their employers) paid for the travel, room, meals and registration fee; and the U.S. Office of Education provided a small amount of financial support to the seminars. These seminars not only developed within the participants increased research knowledge and skill but also increased their enthusiasm for research. This is evidenced by the fact that they subsequently became involved in research projects.

A series of four, one-week seminars were conducted in 1965 following the patterns, for the most part, of the three conducted the previous year--with the addition of another for those who started with the Purdue seminar and who continued in the Illinois seminar in 1964. One major and significant contribution to these seminars was the financial support from P.L. 88-210, Section 4(c). The proposal developed by Rupert Evans (University of Illinois) for conducting the seminars, was approved by the U.S. Office of Education. These funds made it possible to obtain more and better consultants for the seminars as well as to reimburse participants for travel, meals and room.

Pertinent information on the 1965 seminars follows: a beginning seminar on research design and analysis of variance was held May 3-7 at the University of Minnesota, with a new group of vocational educators selected to attend. An intermediate seminar was conducted at the University of Nebraska, April 11-16, on role of the social sciences in vocational education research. The participants in the previous year's seminar on research design were invited to this session. An advanced seminar was held at Michigan State University, April 19-23, including most of the previous participants from the Purdue seminar (1963) and the University of Illinois (1964). This seminar involved the evaluation of proposals, research methodology, and the contribution of psychology, sociology and economics to research in vocational education. A fourth seminar was conducted at Ohio State University, May 24-27, for administrative personnel in state offices, teacher education departments and the research units of state education departments or universities. This seminar focused upon the structure and function of an administrative unit in initiating, coordinating, conducting and administering research projects and programs.

Through informal and semi-formal evaluation of the vocational education research seminars conducted in 1963, 1964 and 1965, it was concluded that the seminars had been successful and of benefit to the participants. Those present were very enthusiastic about the results of the seminars. It was recognized that competent researchers could not be developed within one week, but that the achievement of these professional people was noteworthy--coupled with the fact that they became more active in research projects, which in turn stimulated further in-service education in research.

With the passage of P.L. 88-210 and the availability of money for research in vocational education, many more people became interested in, involved in, and responsible for research. However, the number of qualified researchers had not materially increased. Vocational educators recognize the need to increase their knowledge and competence in research, and desire to do so. Many individuals, who had not previously attended a seminar, expressed to the American Vocational Association Research Committee and to others, their wish to attend one of the research seminars.

The establishment of Research Coordinating Units in vocational education in state education departments or in universities, created the need for additional researchers. These units had the opportunity to provide leadership and coordination in research, and such service was needed. There was evidence, however, that personnel so involved would need assistance in thinking through their roles, relationships and responsibilities. They also need help in developing essential competencies in the administration of research and developmental programs.

There were strong indications that well-trained research personnel were in short supply, and that those employed in universities and state departments of education would need to become more sophisticated in order to design and conduct research projects. An in-service program for staff members in research positions was thus urgently needed. Increased effectiveness and efficiency of individuals in the Research Coordinating Units and in other research positions, would have a positive effect on a wide range of research and developmental activities in the states.

Purpose of Seminars

The major objective of this project was to develop further the research knowledge, competencies, and interests of those engaged in research in the field of vocational education. The project continued, further developed and expanded the vocational education research seminars initiated and conducted by the Research Committee of the American Vocational Association in cooperation with the U.S. Office of Education and selected universities. Six problem-centered areas were identified in which vocational educators could develop research knowledge and abilities. The areas selected were: (1) development and coordination of research by state research coordinating units, (2) curriculum development, (3) tests and measurements, (4) occupational mobility and migration, (5) research design and (6) curriculum evaluation.

Development of Seminar Project for 1966

The Research Committee of AVA asked the administration at Cornell University in February 1965 to consider writing a proposal for funding and coordinating the research seminars in 1966. The reply was in the affirmative, with C. W. Hill named to direct the project. A meeting was called by David Bushnell in Washington, D.C. in May 1965 with selected representatives* from the U.S. Office of Education, AVA Research Committee and universities. The work at hand was to review past seminars and to recommend topics or problem areas for each seminar, as well as make final selection of host universities.

The Project Director contacted the proposed host universities to ascertain whether or not they would sponsor a seminar, and if so, whom they would name as seminar directors. In cooperation with each seminar director the dates, objectives and content were selected for each seminar. The seminar director, with the assistance of a planning committee in each host university, was given the freedom to plan and to develop the seminar program. A quota of 40 participants was established for five of the seminars and 60 for the sixth. The six scheduled seminars are listed below:

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* List of attendants:
    David Bushnell, Director, Occupational Research and Planning
        U.S. Office of Education
    Duane Nielsen, Director, Educational Resources Development Branch
        U.S. Office of Education
    Rupert Evans, University of Illinois
    H. M. Hamlin, North Carolina State University
    C. W. Hill, Cornell University
    Warren Meyer, University of Minnesota
    Elizabeth Ray, Pennsylvania State University
    William Schill, University of Illinois
    Robert E. Taylor, Ohio State University

Problem area of seminar	Date	Host University
Development and Coordination of Research by State Research Coordinating Units	January 30-February 4, 1966	Ohio State University
Curriculum Development	February 7-11, 1966	University of Georgia
Tests and Measurement in Research	March 28-April, 1966	Colorado State University
Occupational Mobility and Migration	April 17-22 1966	North Carolina State University
Research Design	May 2-6, 1966	Cornell University
Curriculum Evaluation	May 16-20, 1966	University of Illinois

A proposal for six vocational education research seminars, as indicated above, was developed with the help of the seminar directors in each university, and was submitted to the U.S. Office of Education in June of 1965. Notification of the approval of the project came in September, with a financial contract in December.

This contract provided money to employ recognized authorities and specialists in education, vocational education, and in the disciplines contributing to research in vocational education, to serve as consultants in each of the seminars. Another major item in the budget was the reimbursement of travel, room and meal expense of invited participants.

Selection of Participants

One major change in conducting the 1966 series of seminars was in the method of selecting participants. A two-page seminar announcement listing problem area, host university, date, quota and content of seminars was developed along with an application form for distribution across the nation. It was mailed to state directors (with a letter requesting that it be distributed to staff), to participants in previous seminars, to directors of Research Coordinating Units, and to deans of schools of education. The September 1965 issue of the American Vocational Journal carried the announcement that those interested might obtain further information and an application form. The AVA Research Committee and other previous participants were asked to submit to the Project Director names of likely applicants who had not as yet attended a seminar.

The applicant was given the opportunity to indicate his first choice, an alternate choice in case his first choice was oversubscribed, and a second-choice seminar at his own expense.

General criteria for the selection of participants were: degrees held (ability to participate in, and benefit from, the seminar), time budgeted to research, involvement in research (completed projects, present projects and projects pending), and reason for attending first-choice seminar.

By November 17, 1965, a total of 346 applications had been submitted within the deadline for the six seminars. An additional 36 applications were submitted later. As can be seen in Table 1, there were more applicants than could be accommodated in all the seminars except one. This one dealt with an area unfamiliar to vocational educators which may account for its low registration.

Table 1. Seminar and Number of Applicantions for Each Seminar

Seminar	Quota	First choice	Alternate to first choice	Second choice
Development and Coordination of Research by State Research Coordinating Units	60	58	16	14
Curriculum Development	40	82	64	9
Tests and Measurement	40	58	44	9
Occupational Mobility and Migration	40	23	27	4
Research Design	40	73	57	15
Curriculum Evaluation	40	52	52	15

The information returned on the application form was coded and punched on IBM cards. The cards were sorted using the previously mentioned criteria, and then listed according to first, alternate-to-first-choice and second-choice seminars. This then produced a print-out by seminar choices, with individuals listed in the order that their qualifications met the criteria.

A Selection Committee composed of the Research Committee and staff from the U.S. Office of Education met November 22 and 23, 1965, to select participants for each of the seminars. Each member of the Selection Committee was provided with a print-out sheet. This sheet and the actual applications were used in the selection of participants. Every selectee was assigned to his first choice except for a few who received an alternate or second-choice seminar. In addition to the applicants who were selected within the quota, two to five U.S. Office of Education staff members were designated to take part in each of the seminars.

A list of those selected and an alternate list for each of the seminars was sent to the host university seminar director, who extended an invitation.

Information on Participants in the Six Seminars

Some of the pertinent information was tabulated from the application forms of those selected to attend the seminars. These data give some background on location of employment, branch of vocational education, and individual positions.

The affiliations and positions of the participants invited from the states are shown in Table 2. A high percentage of those attending the Ohio State seminar were in the state departments of education. Many of the individuals in the Research Coordinating Units were located in state departments, and a few in universities. In the other five seminars a large majority of the participants were in universities affiliated with vocational education.

The branches of vocational education with which the participants were identified are given in part two of Table 2. There were twice as many in agricultural and trade-industrial education branches as in home economics and distributive education. In the Ohio group 26 are listed under "Other". Most of these were researchers, directors or administrators in vocational education, or from the Research Coordinating Units.

The positions in which the participants worked are presented in part three of Table 2. In all of the seminars 108 out of 239 reported themselves to be teacher educators. Many of these had some responsibilities for research. Fifty-four of the participants were the chirman or head of a department in a university or college.

Table 2. Affiliations and Positions of Participants in the Six Vocational Education Research Seminars

Affiliation or Position	Number						
	Ohio State	Georgia	Colorado State	North Carolina State	Cornell	Illinois	Total All Seminars
I. Institution or Agency							
Research Coordinating Unit	20	1	0	4	1	1	27
Higher education (vocational)	8	33	36	18	37	30	162
State education dept. (vocational)	19	3	4	7	2	5	40
Higher education (other than voc.)	2	1	0	1	1	1	6
State education dept. (other than voc.)	3	0	0	0	0	0	3
Public schools	0	1	0	0	0	0	1
TOTALS:	52	39	40	30	41	37	239
II. Branch of Vocational Education							
Agriculture	3	8	10	8	7	10	46
Business	1	2	3	2	6	1	15
Distributive	1	8	2	3	4	5	23
Guidance and Counsel	2	1	2	0	1	1	7
Health Occupations	5	0	0	0	0	1	6
Home Economics	0	5	4	0	9	8	26
Technical	7	3	1	1	2	0	14
Trade and Industrial	5	9	14	7	6	7	48
Other	26	3	3	7	5	3	47
Non Vocational	2	0	1	2	1	1	7
TOTALS:	52	39	40	30	41	37	239
III. Present Position							
Administration	20	0	1	2	0	0	23
Chairman/Head of Dept.	15	10	8	3	9	9	54
Research	6	3	6	2	2	4	23
Supervision	7	2	2	6	1	4	22
Teacher Education (Professor)	3	22	20	15	28	20	108
Teacher, Counselor, Instructor	0	2	2	2	1	0	7
Other	1	0	1	0	0	0	2
TOTALS:	52	39	40	30	41	37	239

Table 3 shows the number of participants who had completed and/or were involved in research projects. For the 239 participants in the six seminars 66 had completed two or more projects; 63, one project; and 110 had completed none. Research projects underway were reported by 148 people, with 91 not so involved.

The percentage of time allotted for research by 239 individuals attending the seminars is shown in part three of Table 3. One-fourth of these budgeted 19 percent or less of their time for research and another almost equal number allotted 20-29 percent for research. The next-largest group had practically all of their time devoted to research.

Table 3. Research Involvement of Participants Attending the Six Vocational Education Research Seminars

Kind of Involvement	Number						
	Ohio State	Georgia	Colorado State	North Carolina State	Cornell	Illinois	Total All Seminars
I. Research Projects Completed							
None	27	19	15	15	19	15	110
One	10	7	13	9	14	10	63
Two or More	15	13	12	6	8	12	66
II. Research Projects Underway							
None	22	10	16	11	17	15	91
One or More	30	29	24	19	24	22	148
III. Percent of Time Allotted to Research							
0 - 9	6	3	5	4	8	3	29
10 - 19	4	4	3	6	7	5	29
20 - 29	9	11	9	8	6	14	57
30 - 39	1	6	3	2	5	4	21
40 - 49	1	1	0	0	2	0	4
50 - 59	5	7	9	4	7	5	37
60 - 69	1	1	0	0	1	1	4
70 - 79	4	1	1	3	1	0	10
80 - 89	3	1	0	0	0	2	6
90 - 100	18	4	10	3	4	3	42

The degrees held, and age distribution of participants in the six seminars are given in Table 4. Seven of the 239 had a bachelor's, 64 held master's and 164 doctoral degrees. A high percentage of the participants in the Colorado and Cornell seminars held doctoral degrees. The age distribution shows that 105 or 44 percent of all the individuals were of ages 40-49. One-third of all the people were in the 30-39 year interval. Seven reported their ages as 60 or more.

Table 4. Degree Held and Age of Participants in the Six Vocational Education Research Seminars

	Number						
	Ohio State	Georgia	Colorado State	North Carolina State	Cornell	Illinois	Total All Seminars
I. Degree Held							
Bachelors	3	0	0	3	0	1	7
Masters	20	11	6	12	7	12	68
Doctorate	29	28	34	15	34	24	164
II. Age							
20 - 29	1	2	3	1	2	2	11
30 - 39	15	13	15	11	14	8	76
40 - 49	24	16	14	14	18	19	105
50 - 59	10	5	6	4	6	5	36
60 or more	2	3	1	0	0	1	7
Not reported	-	-	1	-	1	2	4

Evaluation Procedure

The purpose of the six seminars held in 1966 was: to develop further the research knowledge and competencies of individuals now engaged in, or soon to become engaged in, research activities in the field of vocational education. This statement of purpose led the investigators to design an evaluation emphasizing four areas: satisfactions, change in knowledge, research attitudes, and basic-applied research orientation.

Since the evaluation was the responsibility of the project director rather than each seminar director, it was decided to use an approach which would be uniform in design for all seminars, yet would still allow for tailoring of the instruments to reflect the specific seminar content and purpose.

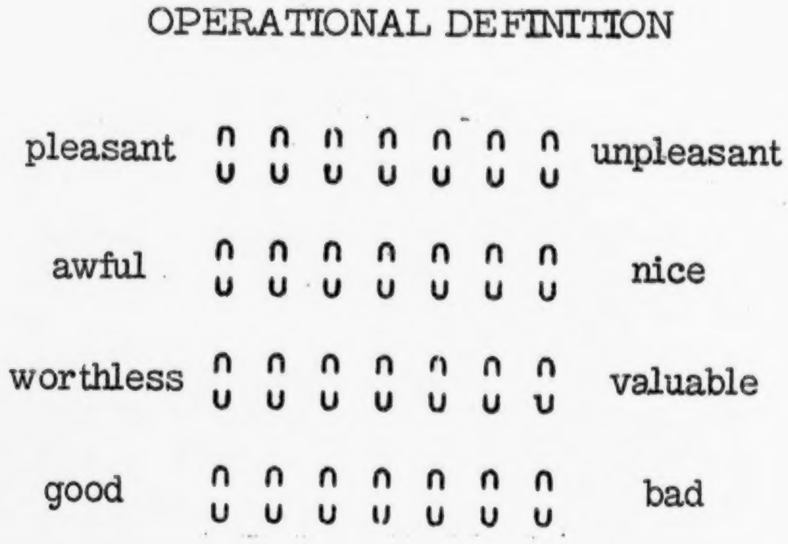
Instruments Used

Satisfactions. For measuring participant satisfactions concerning the seminar, a Likert-type instrument was adapted from a form developed by Welden (3). This form consisted of thirty statements to which each participant was to indicate his degree of agreement. An attached second-page asked five open-ended questions concerning the seminar and personal plans for applying the results. These were given to each participant on Thursday and were collected Friday morning. Neither page carried personal identification. (The participants were made aware of this fact.)

Knowledge. A pretest and posttest were developed for each of the seminars based upon the major content to be covered. The posttest consisted of twenty multiple-choice questions. These same twenty questions were divided into two groups for the pre-tests. i.e., the odd numbered questions grouped together comprised Form 1, while even numbered questions made up Form 2. The investigators developed the twenty questions used for the Ohio, Georgia, North Carolina and Illinois seminars on the basis of papers to be delivered at the seminar--which papers were available prior to the seminar. The director of the Colorado seminar devised the test to be given there but, followed the same general pattern of using one-half of the posttest to make up each of the pretests. The two major consultants for the Cornell seminar (Krathwohl and MacEachern), each devised fourteen questions, with ten from each list selected by the investigators.

Attitudes. The instrument used to study attitudes consisted of thirty research terms presented in the form of an Osgood semantic differential. These research terms were selected by analyzing the overall proposal for all seminars and the purposes, objectives and proposed content of the six seminars. The terms chosen represented both specific terms related directly to one or two seminars, and general terms expected to be related to all seminars.

This instrument consisted of thirty IBM cards each printed with a single concept and four bipolar seven point scales. These were selected from "The Measurement of Meaning" by Osgood and were all in the evaluative dimension. The cards were designed to allow participants to mark responses which were then read and punched by machine.



OPERATIONAL DEFINITION

pleasant	○	○	○	○	○	○	○	unpleasant
awful	○	○	○	○	○	○	○	nice
worthless	○	○	○	○	○	○	○	valuable
good	○	○	○	○	○	○	○	bad

Figure 1. Example of card used in the assessment of attitudes.

The thirty concepts were put in random order, and again the odd-numbered concepts were given as Form 1 of the pretest, while the other fifteen were given as Form 2. The posttest comprised all thirty concepts.

Basic vs. Applied Research Orientation. The fourth area studied consisted of two types of scales: (a) a modified basic vs. applied research instrument developed by Storer (2) and (b) a modified form adopted from "Organizing Educational Research" by Lazarsfeld and Sieber (1) which presented three questions to which responses could be placed on a five-point continuum. These two types were administered to all participants in the posttest. The pretest consisted of one-half of the participants marking Storer's instrument while the other half responded to the Lazarsfeld form.

Design of the Administration of Evaluation

Two forms for each of these three areas of evaluation (knowledge, attitudes, and research orientation) allowed a balanced design of eight possible combinations. The participants of each seminar were assigned one of these combinations by means of systematic sampling.

The pretest packet containing one form of each of the three types were distributed on the Monday morning of each seminar. The posttest was administered on Friday morning.

Analysis of Data

The purpose of this evaluation was to analyze the effects of the six seminars in regards to satisfactions, knowledge, attitudes toward research, and applied vs. basic research orientation. The procedures used in analysis of the data are described below. The results are presented in connection with the summary discussion of each seminar.

Satisfactions. The responses to the satisfactions forms were analyzed by means of the Cornell Computing Center XTABS program. The median was then determined by the graphic method. The medians and frequency distributions of responses to each statement are given for each seminar.

Knowledge. The responses to pretest and posttest questions were coded and punched on cards. A percentage score was then computed and punched on the same card for the ten-item pretest, the twenty-item posttest, and the ten items of the posttest which corresponded to the ten items given the participant in the pretest. These data were then analyzed to present the numbers of persons showing gains, losses, or no-change between pretest score and total posttest score, and between equivalent-items pretest and posttest score.

Attitudes. Since the thirty research items were assigned at random to Form 1 and Form 2 of the pretest, which in turn were assigned by systematic randomization to participants, it was assumed that the mean response to pretest items was an unbiased estimate of the group mean.

The analysis therefore consists of a comparison of the estimated group means for pretest items with the actual group means for posttest items. These data are presented by means of a table of pretest and posttest mean responses per item, and a chart which illustrates the direction and magnitude of change from pretest to posttest.

Basic vs. Applied Research Orientation. The two forms used to explore the orientations of participants toward basic and applied research were analyzed by comparing the responses given to each specific question at the time of pretest with the responses given to the same question, by the same participants four days later. The frequency distributions of responses to each question for both pretest and posttest, and the mean response value are given in tabular form. For comparison purposes the pretest and posttest means are also presented for all seminars (giving equal weight to each seminar).

SEMINAR PROGRAMS CONDUCTED

Each host university selected or accepted a problem area around which a research program was planned and conducted. The director of each seminar was asked to use the assistance of a program-planning committee. Funds were available to engage outstanding consultants for the presentations. Insofar as was possible and consistent with the program plans, consultants were asked to prepare papers in advance of the seminars for distribution to participants. The seminar directors at the Universities of Georgia and Illinois were very successful in obtaining copies of speeches before the seminars. In other seminars papers and varying techniques were used in presentations.

A general observation reflected in the evaluation of the seminars by the participants, is that the consultants in the various disciplines such as sociology, economics, psychology, philosophy made good-to-excellent presentations. But the relevance to research varied greatly on a continuum from very applicable to of little use. This was apparent when research was presented from academic fields to illustrate designs for use in vocational education. The discussion became centered on the study--or in research itself and its value per se--rather than upon its applicability to research in vocational education.

A brief review of each seminar program is given in this section. Copies of the seminar programs and lists of participants are duplicated in the appendix.

The data and discussion following the program are the results of the four types of instruments used in seminar evaluation. For optimum interpretation and understanding the reader will find it necessary to study the Evaluation Procedures section appearing on pages 10-12.

The tables and figures presenting the data on satisfactions and attitudes lend themselves to a much greater explanation and interpretation than it is feasible to present in this report. It is therefore suggested that study of these tables will prove informative.

Development and Coordination of Research by State Research Coordinating Units

- Ohio -

Program

This seminar was planned and directed by Robert E. Taylor and Virgil Christensen at Ohio State University, January 31 - February 4, 1966. A special effort was made to develop a program for personnel in the Research Coordinating Units newly established within twenty-three states, and for personnel in other states which may establish units.

In this seminar, major speeches and study were focused upon the role and policies of RCU staff, the structuring and organizing of RCU's, efficient and effective operations and management, selection of research problems and development of proposals, diffusion and dissemination of research and development information.

The major speeches and consultants were:

The Research and Development Concept - What Is There to be Done and Who Can Do It Best?	Ray Jongeward Director of Research Office of Public Instruction Olympia, Washington
Implications of Diffusion Research to Implemented Change in Education	H. F. Lionberger Rural Sociology University of Missouri
Improving Research in Vocational Education	Alan Knox Teachers College Columbia University
What Constitutes a Researchable Problem and a Respectable Proposal	Egon Guba Professor of Education Ohio State University
Putting Data Processing to Work in Vocational Education	Loyal Joos
Putting PERT to Work in Research Coordinating Units	Desmond Cook Professor of Education Ohio State University
Dissemination of Research and Development Information	Harold Haswell Director, ERIC U.S. Office of Education
What Lies Ahead	David Bushnell, Director Adult and Vocational Research U.S. Office of Education

The seminar was dynamic and moving, with good balance, placement and timing of lectures; group interaction; question periods after lectures; questions and reactions by participants; reactor panels to lectures; discussion groups; panels; discussion period with consultants; round-table discussions; stimulation sessions and workshop sessions. All of these methods and techniques made for varied, challenging, interesting meetings involving the participants.

The proceedings of this seminar was published in the report "Research Development and Coordination - A Seminar Report" by Robert Taylor and Virgil Christensen, Center for Vocational and Technical Education, The Ohio State University.

Evaluation

Satisfactions. The data presented in Table 5 represent the frequency distribution and median for each of the thirty statements of the Satisfactions evaluation form. One-half of these statements were presented in the positive form with the others in the negative form. Rather than presenting a lengthy discussion of all these data the reader is advised to study the distribution of responses as well as the median for each of the statements. The following will therefore mention only a few of the highlights.

The results of the Ohio seminar show agreement with all positive statements and disagreement with all negative statements. The median indicates that participants agree most with statements 14, 29 and 7 and disagreed most with statements 6 and 30.

Knowledge. The results of the test on content presented in this seminar resulted in 3 people attaining scores between 40-49%, 8 between 50-59%, 21 between 60-69%, 14 between 70-79% and 5 between 80-89%. Since no pretest* was given there is no indication of how much change resulted from this seminar.

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* Because of heavy snow storms, it was not possible for the Project Director to administer the pre-evaluation forms.

Table 5. Median and Frequency Distribution
for Degree of Agreement with Statements of Satisfaction

- Ohio Seminar -

Statements	Median	Frequency Distribution: Strongly Agree (5)	Agree (4)	Un-decided (3)	Dis-agree (2)	Strongly Disagree (1)
In regard to this conference I feel that:						
1. The purposes of this program were clear to me	3.8	19	22	4	3	0
2. The objectives of this program were not realistic	1.4	2	3	3	25	15
3. Specific purposes made it easy to work efficiently	3.7	6	30	9	3	0
4. The participants accepted the purposes of this program	3.6	10	32	4	2	0
5. The objectives of this program were not the same as my objectives	1.7	2	11	5	19	11
6. I didn't learn anything new	0.7	1	0	0	11	36
7. The material presented was valuable to me	4.1	26	20	1	1	0
8. I could have learned as much by reading a book	0.8	1	0	1	16	30
9. Possible solutions to my problems were considered	[illegible]	10	26	5	5	2
10. The information presented was too elementary	.3	0	2	1	29	16
11. The speakers really knew their subjects	3.6	14	27	4	3	0
12. The discussion leaders were not well prepared	1.5	0	7	4	24	13
13. I was stimulated to think objectively about the topics presented	3.6	11	35	0	2	0
14. New acquaintances were made which will help in future research	4.2	31	16	0	1	0
15. We worked together as a group	3.8	18	26	2	2	0
16. We did not relate theory to practice	1.6	2	4	8	24	10
17. The sessions followed a logical pattern	3.6	11	30	5	2	0
18. The schedule was too fixed	1.5	0	7	4	25	12
19. The group discussions were excellent	3.4	6	27	5	9	1
20. There was very little time for informal conversation	1.6	5	6	1	28	8
21. I did not have an opportunity to express my ideas	1.3	1	2	1	27	17
22. I really felt a part of this group	3.6	11	31	2	2	2
23. My time was well spent	3.7	16	28	0	3	1
24. The program met my expectations	3.5	14	19	7	7	1
25. I have no guide for future action	1.4	0	2	5	24	17
26. Too much time was devoted to trivial matters	1.3	0	3	2	28	15
27. The information presented was too advanced	1.5	0	3	3	32	10
28. The content presented was not applicable to research in vo-ed	1.2	0	1	3	25	19
29. Seminars of this nature should be offered again in future years	4.2	29	17	1	1	0
30. Seminars such as this will contribute little to vo-ed research	0.8	0	1	2	15	30

Attitudes. Since no pretest was administered to this group Table 6 shows only the posttest mean response per item for this seminar and the mean item response for all seminar posttests, giving equal weight to each seminar.

The research terms receiving the highest evaluative mean responses in this seminar were: dissemination, funding, experimental research, data processing, and statement of problem. Other than the two negative terms, the only research term to receive a mean response of less than 5 was nominal scaling.

Table 6. Change in Attitudes toward Research Terms
- Ohio Seminar -

Research Term	Mean Posttest	Mean All Seminars Posttest
Variance	5.45	5.315
Non Parametric	5.03	4.905
Sampling	5.88	5.828
Dissemination	6.05	5.955
Diffusion Research	5.46	5.003
Applied Research	5.65	5.965
Invalidity	3.51	3.153
Funding	6.16	5.785
Action Research	5.73	5.763
Research Design	5.82	5.770
Developmental Research	5.72	5.766
Basic Research	5.78	5.703
Experimental Research	6.07	6.040
Operational Definition	5.51	5.608
Nominal Scaling	4.89	4.956
Research Proposal	5.53	5.620
Measurement	5.69	5.751
Hypotheses	5.81	5.688
Research Findings	5.66	5.746
Evaluation	5.65	5.771
Contamination	3.02	2.958
Inference	5.23	5.216
Generalization	5.59	5.326
Review of Literature	5.40	5.593
Data Processing	6.02	5.753
Randomization	5.56	5.596
Theoretical Framework	5.59	5.505
Statistician	5.71	5.578
Statement of Problem	6.01	5.851
Reliability	5.88	5.871

Applied vs. Basic Research Orientation. The responses to the questions administered at the end of the seminar concerning participants' orientation toward basic and applied research, are given in Tables 7 and 8. The first table gives the number of participants checking each of the five divisions on the continuum from applied to basic, and the mean response for this group and for all seminars. The second table indicates the number of persons checking each response to the five questions regarding research preference for this group and for all seminars.

It can be seen from Table 7 that most participants indicated the prime concern of their present organization to be largely applied ($\bar{X} = 2.2$). It is interesting to note that they prefer this concern to the slightly more basic (2.4) and their personal desires are still more basic (2.6).

Table 8 shows that most would prefer to publish their research in popular publications (34), whereas there were 16 who would prefer publishing in scientific journals. In making a choice between working on practical problems or contributing to development of a body of scientific knowledge, the majority (30) responded definitely for practical problems. The chance to serve people was of utmost importance, with only 11 persons not so indicating.

Table 7. Frequency Distribution and Means of Responses to Lazarsfeld's Form of Applied vs. Basic Research Orientation

- Ohio Seminar -

A. Where would you locate the orientation or prime concern of the organization with which you are presently working?

		Frequency Distribution						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	Ohio	All Seminars
Posttest		13	25	8	4	1		2.2	2.15

B. Where on the same continuum would you prefer the orientation of your organization to be located?

		Frequency Distribution						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	Ohio	All Seminars
Posttest		9	18	20	1	3		2.4	2.40

C. Where on this continuum would you like to do research?

		Frequency Distribution						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	Ohio	All Seminars
Posttest		13	18	7	4	9		2.6	2.61

Table 8. Means and Frequency Distribution of Responses to Storer's Scale of Basic vs. Applied Research Orientation

- Ohio Seminar -

A. If you had to choose between reporting your research in a popular publication where laymen would see it and perhaps use your findings, or reporting it in a scientific journal, which would you prefer?

Response	Distribution Posttest	Means Ohio Posttest	 All Seminars Posttest
Definitely popular publication	23	2.3	2.95
Somewhat popular publication	11		
I can't make up my mind	1		
Somewhat scientific journal	10		
Definitely scientific journal	6		

B. If it ever came to a choice between working on the practical problems of vocational education (problems important to the local schools), or contributing to the development of a body of scientific knowledge, which would you prefer to do?

Response	Distribution Posttest	Means Ohio Posttest	 All Seminars Posttest
Definitely practical problems	30	2.1	2.51
Somewhat practical problems	5		
I can't make up my mind	4		
Somewhat scientific knowledge	6		
Definitely scientific knowledge	6		

C. How important to you in a job is the chance to serve people, i.e., to help solve their problems?

Response	Distribution Posttest	Means Ohio Posttest	 All Seminars Posttest
Of utmost importance	40	1.3	1.55
Very important	9		
Somewhat important	1		
Not very important	1		
Unimportant	0		

Curriculum Development

- Georgia -

Program

This seminar was held at the University of Georgia, February 7-11, 1966, with Herschel Lester, Jr. serving as seminar director.

The aim of the seminar was to help researchers in vocational education acquire better knowledge and more ability to undertake research in curricula development. The program was designed to analyze and criticize educational research reports, studies, and other literature directly related to designing and evaluating vocational-technical curricula. The major emphasis was placed upon the participants' gaining a more complete understanding of the existing research methods believed to be useful in controlling curricula variables and in designing curricula development projects. To achieve this, the following presentations were given:

Curriculum Studies - A Challenge	Duane Nielsen Educational Resources Development Branch U.S. Office of Education
Labor Market Analysis and Projections	Robert E. Maritold U.S. Department of Labor
The Interpretation of Economic Data	Norman S. Wood Department of Economics University of Georgia
Social Stratification	Raymond Payne Department of Sociology University of Georgia
Relationships of Community Environment to Vocational Education Curriculum	Selz C. Mayo Department of Sociology North Carolina State University
Educational Psychology in the Curriculum	Joe Bledsoe College of Education University of Georgia
Statistical Models in Curriculum Development	Harry Anderson Center for Educational Stimulation University of Georgia
The New Mathematics: A Pattern for Curriculum Reform	Joseph R. Hooten, Jr. College of Education University of Georgia
Curriculum Development and Evaluation in English	Mary J. Tingle College of Education University of Georgia
The Anthropology Curriculum Project as a Model for Curriculum Development: Practical Problems	Marion Rice College of Education University of Georgia

Panel Review of Current Curriculum Studies:

Development and Evaluation of an Experimental Curriculum for the New Quincy, Massachusetts Vocational-Technical School	Edward J. Morrison American Institute of Research
An Experimental Evaluation of Approaches to Preparing High School Students for Agricultural Occupations	John Coster University of Nebraska
Occupational Requirements in Office Occupations for School Learners	Fred Cook Business Education Wayne State University
Evaluation of Secondary School Programs to Prepare Students for Wage Earning in Occupations Related to Home Economics	Helen Nelson Department of Home Economics Education Cornell University
General Proposal Writing	Warren Findley Center for Educational Stimulation College of Education University of Georgia

Panel - Formal Review of Prepared Curriculum Proposals by the University of Georgia Education staff:

Kathryn Blake
Charles Johnson
Karl King
James B. Konnecny
Leonard Pikaart

The principal method of presentation was a series of lectures by consultants, with a question period after each lecture. On Thursday afternoon and Friday morning, a panel of five members of the University of Georgia faculty reviewed and criticized curricula-development proposals which had been submitted by the participants. This was a highlight in the seminar.

The presentations for this seminar were compiled into a published report entitled, "Report of a National Vocational-Technical Education Seminar on Research and Curriculum Development" by Herschel T. Lester, Jr., Editor and Seminar Director, Vocational Research, College of Education, University of Georgia, Athens, Georgia. It was distributed to participants and others in May 1966.

Evaluation

Satisfactions. The data presented in Table 9 represent the frequency distribution and median for each of the thirty statements of the Satisfactions evaluation form. One-half of these statements were presented in the positive form with the others in the negative form. Rather than presenting a lengthy discussion of all these data, it is advised that the reader study the distribution of responses as well as the median for each of the statements. The following will therefore mention only the highlights.

The median responses for this seminar indicate agreement with all but two (3 and 24) of the positive statements, and disagreement with all the negative statements. The positive statements resulting in greatest agreement are 14 and 29, whereas the negative statements receiving most disagreement are 6, 21, 27, and 30.

Knowledge. The data presented in Table 10 gives the frequency distribution of changes in scores from pretest to posttest. The first row gives the frequency of change for scores computed on items which appeared on both the participants' pretest and posttest. The second row gives the frequency of change from the participants' pretest score to the score for all items on the posttest. Also given is the distribution of posttest scores.

In this seminar 23 people increased their scores on the items appearing on both pretest and posttest. There were only 6 receiving lower scores, and 9 who showed no change. In the comparison of scores between pretest and total posttest there were 20 increasing their scores, while 11 remained the same, and 7 fell below their pretest level.

The highest scores on the total item posttest were in the 80-89% range with most people achieving at least 60%.

Table 10. Change in Content Knowledge Scores From Pretest to Posttest

- Georgia Seminar -

	Number of Persons Showing					
	Decreased Score	No Change	Increased Score by:			
			10%	20%	30%	40% or more
Change in scores for items on both pretest and posttest	6	9	10	3	5	5
Change in scores from both pretests to all items on the posttest.	7	11	8	5	3	4

Frequency Distribution of Posttest Scores

Percentage score	01-19%	20-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-89%	90-99%
Frequency	0	0	6	5	9	13	4	2	0

Table 9. Median and Frequency Distribution for Degree of Agreement with Statements of Satisfaction

- Georgia Seminar -

Statements	Median	Frequency Distribution				
		Strongly Agree (5)	Agree (4)	Un-decided (3)	Dis-agree (2)	Strongly Disagree (1)
In regard to this conference I feel that:						
1. The purposes of this program were clear to me	3.3	5	19	2	10	3
2. The objectives of this program were not realistic	1.8	2	8	5	18	6
3. Specific purposes made it easy to work efficiently	2.8	5	13	5	11	5
4. The participants accepted the purposes of this program.	3.2	4	20	9	6	0
5. The objectives of this program were not the same as my objectives	1.9	4	12	1	14	8
6. I didn't learn anything new	1.1	2	2	4	12	19
7. The material presented was valuable to me . .	3.5	12	14	5	7	1
8. I could have learned as much by reading a book.	1.5	4	6	3	12	14
9. Possible solutions to my problems were considered.	3.3	4	22	5	8	0
10. The information presented was too elementary.	1.9	5	9	4	15	6
11. The speakers really knew their subjects . . .	3.6	12	16	8	2	1
12. The discussion leaders were not well prepared	1.5	1	3	8	15	12
13. I was stimulated to think objectively about the topics presented.	3.3	8	16	3	11	1
14. New acquaintances were made which will help in future research.	4.0	19	15	3	2	0
15. We worked together as a group	3.2	5	17	4	8	5
16. We did not relate theory to practice.	1.9	5	7	5	13	9
17. The sessions followed a logical patte.	3.4	8	17	3	9	2
18. The schedule was too fixed.	1.8	7	7	1	19	5
19. The group discussions were excellent.	3.1	5	15	5	11	3
20. There was very little time for informal conversation.	1.7	2	7	3	22	5
21. I did not have an opportunity to express my ideas	1.3	0	2	3	21	13
22. I really felt a part of this group.	3.5	8	23	4	4	0
23. My time was well spent.	3.4	9	17	4	8	1
24. The program met my expectations	2.7	5	13	3	13	5
25. I have no guide for future action	1.5	0	6	3	19	11
26. Too much time was devoted to trivial matters.	1.9	2	10	5	12	10
27. The information presented was too advanced. .	1.2	0	2	0	20	17
28. The content presented was not applicable to research in vo-ed	1.5	0	5	3	21	10
29. Seminars of this nature should be offered again in the future	4.0	19	13	3	4	0
30. Seminars such as this will contribute little to vo-ed research	1.2	0	4	3	15	17

Attitudes. The data presented in Table 11 are the pretest and posttest means for this seminar and the means for all seminars, giving equal weight to each seminar. Figure 2 represents the direction and magnitude of change (in hundredths of a point) from pretest to posttest. The reader must consider the table and the chart together, as well as the relationship between the item means for this seminar and the item means for all the seminars. (It must also be noted that the direction of change from pretest to posttest response for the two negative items, i.e., invalidity and contamination, have been inverted so as to be consistent with the 28 positive items.)

As was the case in presenting the data derived from the Satisfactions evaluation form, only the highlights of these data will be presented below. It is suggested that study of the data presented in both the table and chart will be most informative.

An important factor to consider in analysis of the data presented here is the fact that the Georgia seminar recorded higher mean item responses on the pretest than any other seminar, for 14 of the 30 research terms. This then may indicate that the large degree of negative change from pretest to posttest is more a result of the statistical artifact of regression toward the mean, characteristic of test-retest results on the sematic differential, than of actual negative changes in attitude. A further indication that this may be the case is the observation that all but three of the research terms pretest means are above the average of pretest means for all seminars.

None of the research terms received a mean posttest score of 6 or more. The terms receiving highest rating on the scales were applied research and action research. With the exception of the two negative terms, diffusion research was the only term to receive a posttest mean less than 5.

The distribution of change can be seen to be almost completely negative. This (as mentioned above), may be primarily a result of regression toward the mean, in the judgment of investigators. The terms showing greatest negative change are: experimental research, measurement, theoretical framework, and statement of problem. The two terms showing greatest positive change are invalidity and contamination.

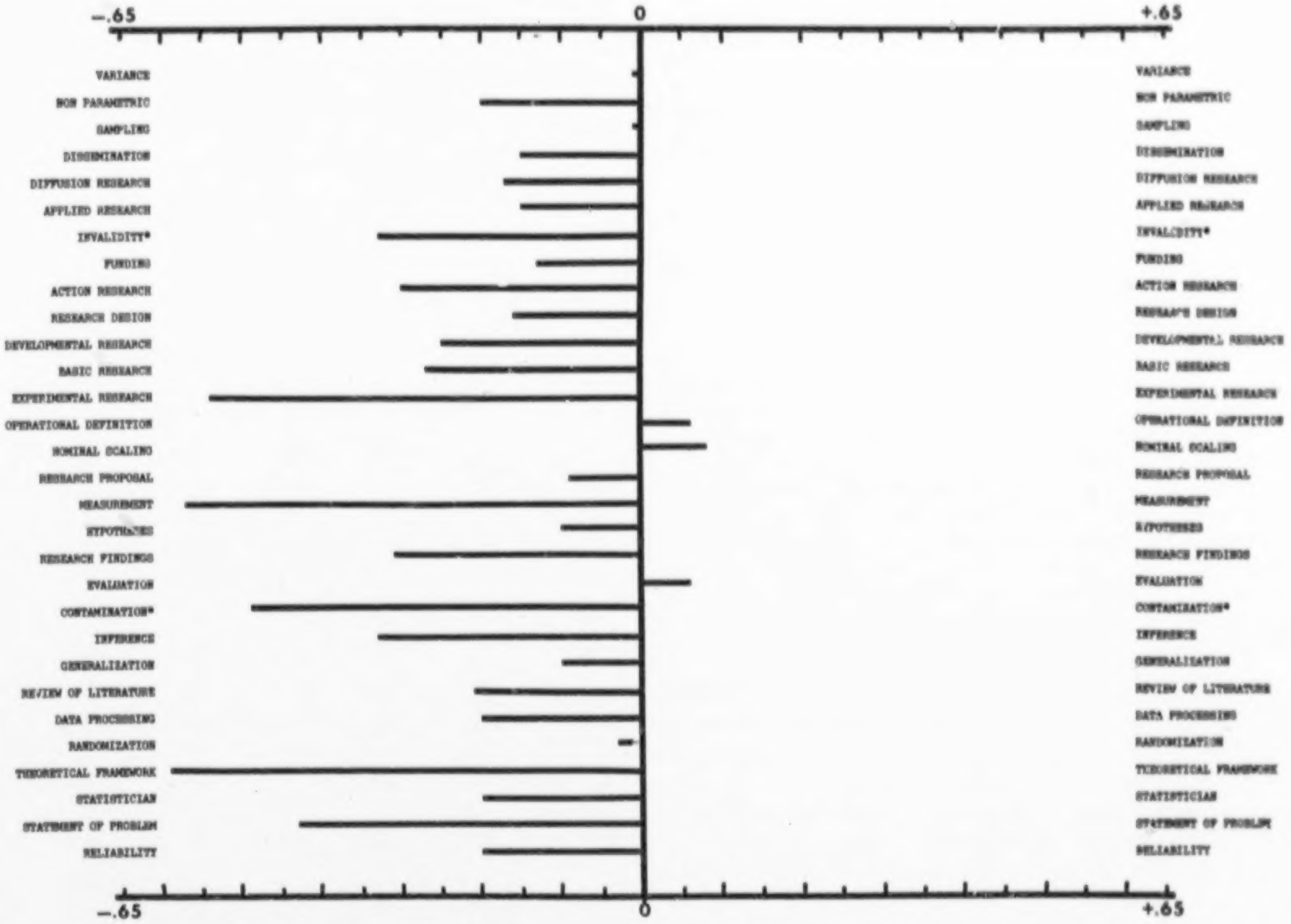

Figure 2. DIRECTION AND MAGNITUDE OF CHANGE FROM PRETEST TO POSTTEST IN MEAN RESPONSES TO 30 RESEARCH TERMS PRESENTED IN THE SEMANTIC DIFFERENTIAL FORM

- GEORGIA SEMINAR -

*A negative change in direction for the two negative terms are presented as a positive change whereas a positive change is presented in the negative direction.

Table 11. Change in Attitudes toward Research Terms

- Georgia Seminar -

Research Term	Mean			
	Georgia		All Seminars	
	Pretest	Posttest	Pretest	Posttest
Variance	5.48	5.47	5.272	5.315
Non Parametric	5.19	5.09	4.794	4.905
Sampling	5.90	5.89	5.748	5.828
Dissemination	6.09	5.94	6.014	5.955
Diffusion Research	4.81	4.64	4.764	5.003
Applied Research	6.09	5.94	6.032	5.965
Invalidity	3.00	3.33	3.044	3.153
Funding	6.00	5.87	5.450	5.785
Action Research	6.22	5.92	5.674	5.763
Research Design	5.73	5.57	5.790	5.770
Developmental Research	6.01	5.76	5.756	5.766
Basic Research	5.67	5.50	5.712	5.703
Experimental Research	6.21	5.67	5.956	6.040
Operational Definition	5.60	5.66	5.480	5.608
Nominal Scaling	4.82	5.10	4.726	4.956
Research Proposal	5.72	5.63	5.572	5.620
Measurement	6.15	5.58	5.808	5.751
Hypotheses	5.71	5.61	5.670	5.688
Research Findings	5.93	5.62	5.800	5.746
Evaluation	5.57	5.63	5.760	5.771
Cotamination	2.58	3.07	2.944	2.958
Inference	5.64	5.31	5.266	5.216
Generalization	5.35	5.25	5.276	5.326
Review of Literature	5.69	5.48	5.620	5.593
Data Processing	5.91	5.71	5.746	5.753
Randomization	5.46	5.43	5.354	5.596
Theoretical Framework	6.05	5.46	5.734	5.505
Statistician	5.52	5.32	5.462	5.578
Statement of Problem	6.16	5.73	5.924	5.851
Reliability	5.81	5.71	5.742	5.871

Applied vs. Basic Research Orientation. The data in Tables 12 and 13 give the frequency of responses to each of three questions which were given to participants both in pretest and posttest. The tables also indicate the mean response to questions for this group as well as the mean response for all seminars, giving equal weights to seminars.

The participants responding to this instrument indicated that their personal research preference is more basic than they would have their organization undertake and also that the organization is concerned with work which is more applied than they would prefer. The data in Table 12 also show that only 5 out of 20 responded on the basic half of the continuum.

Table 13 shows that in the pretest the participants were evenly distributed between publishing their research in popular and in scientific publications. The posttest, however, shows a slight shift toward preferring the scientific journal. The choice between working on practical problems or contributing to the development of a body of scientific knowledge shows just the opposite shift. The chance to serve people remained of great importance.

Table 12. Means, Frequency Distribution of Responses to Lazarsfeld's Form of Applied vs. Basic Research Orientation

- Georgia Seminar -

A. Where would you locate the orientation or prime concern of the organization with which you are presently working?

		Response Frequency						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	Georgia	All Seminars
Pretest		7	8	0	5	0		2.2	2.16
Posttest		5	7	4	4	0		2.4	2.15

B. Where on the same continuum would you prefer the orientation of your organization to be located?

		Response Frequency						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	Georgia	All Seminars
Pretest		2	8	6	3	1		2.7	2.66
Posttest		3	7	8	2	0		2.5	2.40

C. Where on this continuum would you like to do research?

		Response Frequency						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	Georgia	All Seminars
Pretest		5	5	5	4	1		2.6	2.54
Posttest		4	7	6	3	0		3.0	2.61

Table 13. Means and Frequency Distribution of Responses to Storer's Scale of Basic vs. Applied Research Orientation

- Georgia Seminar -

A. If you had to choose between reporting your research in a popular publication where laymen would see it and perhaps use your findings, or reporting it in a scientific journal, which would you prefer?

			Means			
	Distribution		Georgia		All Seminars	
Response	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Definitely popular publication	3	4	2.9	3.1	2.96	2.95
Somewhat popular publication	6	3				
I can't make up my mind	1	0				
Somewhat scientific journal	5	9				
Definitely scientific journal	3	2				

B. If it ever came to a choice between working on the practical problems of vocational education (problems important to the local schools), or contributing to the development of a body of scientific knowledge, which would you prefer to do?

			Means			
	Distribution		Georgia		All Seminars	
Response	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Definitely practical problems	4	6	2.9	2.5	2.74	2.51
Somewhat practical problems	4	5				
I can't make up my mind	1	1				
Somewhat scientific knowledge	8	4				
Definitely scientific knowledge	1	2				

C. How important to you in a job is the chance to serve people, i.e., to help solve their problems?

			Means			
	Distribution		Georgia		All Seminars	
Response	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Of utmost importance	13	10	1.4	1.6	1.60	[illegible]
Very important	3	6				
Somewhat important	2	2				
Not very important	0	0				
Unimportant	0	0				

Tests and Measurement

- Colorado -

Program

This seminar was conducted at Colorado State University, March 28 - April 1, 1966 under the direction of Douglas Sjogren, Seminar Director. A large percentage of the participants had attended previous years' seminars. Also, they had been and/or were involved in research projects. Interest in the problem area was very high--as evidenced by the fact that only two invitees declined an invitation just a few days before the seminar. Two others readily filled their place.

Three major factors contributed to the success of the seminar. These factors were: (1) inclusion of adequate time for questions and discussion by the participants concerning the major presentations, (2) the workshop on developing attitude scales and tests and (3) provision of time for participants to discuss many and varied topics and seminar presentations, to talk with consultants, and to complete workshop assignments.

As may be seen below, there were few major speeches in the seminar; but there was adequate time for questions and discussion from the audience immediately following the presentation, and for later individual discussion with the consultant. The talks were well interspersed with workshop sessions. These were the major presentations:

Tests and Measurements	J. Stanley Ahmann Academic Vice President Colorado State University
Test and Validity in Predictive Research	Garlie Forehand Department of Psychology Carnegie Institute of Technology
Available Tests and Their Use in Research in Vocational Education	Margaret Crawford Assistant Dean of Counseling and Guidance Los Angeles Trade-Technical College
Test Validity in Experimental and Curriculum Research	Robert Stake University of Illinois
Validity in Survey Research	Alan Knox Teachers College Columbia University

Dr. Charles O. Neidt, assisted by Dr. C. Dean Miller, conducted a workshop (in the true sense of the word), beginning on Monday afternoon, and dealing with the development of attitude scales. First a review was given of the various techniques used and the theory behind them. The discussion and work focused upon the attitude scales, using the Thurstone and Likert Techniques. The participants were divided into four groups. Each was given the assignment of developing items and validating them. The workshop was continued on Thursday afternoon to review the past assignment and achievements and to set the stage for continued work. The workshop was completed on Friday morning.

No written report of the seminar content was planned. It was assumed that only the participants in the seminar were likely to benefit from the seminar. One of the values derived was the exchange of ideas, motivation and stimulation of interest in, and desire for, the proper use of tests and measurements.

Evaluation

Satisfactions. The data presented in Table 14 represent the frequency distribution and median for each of the thirty statements of the Satisfactions evaluation form. One-half of these statements were presented in the positive form, with the others in the negative form. Rather than presenting a lengthy discussion of all these data the reader is advised to study the distribution of responses as well as the median for each of the statements. The following will therefore point out only the highlights.

The median responses of this seminar show agreement with all positive statements and disagreement with all negative statements. The statements resulting in greatest agreement are 14 and 29, while negative statements 6, 20, 21, and 30 showed greatest disagreement.

Knowledge. The data presented in Table 15 gives the number of people and change in scores from pretest to posttest. The first row gives the frequency of change for scores computed on items which appeared on both the participants' pretest and posttest. The second row gives the frequency of change from the participants' pretest score to the score for all items on the posttest. Also given is the distribution of posttest percentage scores.

This seminar appeared to have a rather difficult test, with no one receiving a total item posttest score greater than 59. Most were in the range between 40 and 49%.

There were only 6 persons showing gains in scores from pretest to same-item posttest, while 9 showed no change, and 22 a loss. The pattern was repeated in a comparison of pretest and total posttest scores where 5 showed gains, 14 no change, and 19 a loss.

Table 15. Change in Content Knowledge Scores from Pretest to Posttest

- Colorado Seminar -

	Number of Persons Showing					
	Decreased Score	No Change	Increased Score by: 10%	20%	30%	40% or more
Change in scores for items on both pretest and posttest	22	9	4	2	0	0
Change in scores from both pretests to all items on the posttest.	19	14	4	1	0	0

Frequency Distribution of Posttest Scores

Percentage score	01-19%	20-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-89%	90-99%
Frequency	1	2	13	20	2	0	0	0	0

Table 14. Median and Frequency Distribution
for Degree of Agreement with Statements of Satisfaction

- Colorado Seminar -

		Frequency Distribution				
Statements	Median	Strongly Agree (5)	Agree (4)	Un-decided (3)	Dis-agree (2)	Strongly Disagree (1)
In regard to this conference I feel that:						
1. The purposes of this program were clear to me	3.6	10	24	3	1	2
2. The objectives of this program were not realistic	1.5	2	2	3	23	10
3. Specific purposes made it easy to work efficiently	3.4	7	22	8	2	1
4. The participants accepted the purposes of this program.	3.5	5	27	8	0	0
5. The objectives of this program were not the same as my objectives	1.7	3	6	5	20	6
6. I didn't learn anything new	1.1	0	0	0	21	19
7. The material presented was valuable to me . .	3.6	9	25	3	1	2
8. I could have learned as much by reading a book	1.4	0	3	2	25	10
9. Possible solutions to my problems were considered.	3.3	3	24	6	7	0
10. The information presented was too elementary.	1.2	0	3	0	22	15
11. The speakers really knew their subjects . . .	3.6	9	24	5	0	2
12. The discussion leaders were not well prepared	1.4	0	2	5	20	13
13. I was stimulated to think objectively about the topics presented.	3.7	11	27	1	1	0
14. New acquaintances were made which will help in future research.	4.1	21	15	2	2	0
15. We worked together as a group	3.8	15	24	1	0	0
16. We did not relate theory to practice.	1.5	0	4	4	23	9
17. The sessions followed a logical pattern . . .	3.4	7	22	8	2	1
18. The schedule was too fixed.	1.4	0	0	4	25	11
19. The group discussions were excellent.	3.2	3	21	10	6	0
20. There was very little time for informal conversation.	1.1	0	1	1	20	18
21. I did not have an opportunity to express my ideas	1.1	0	1	0	21	18
22. I really felt a part of this group.	3.6	7	28	3	2	0
23. My time was well spent.	3.6	10	25	4	1	0
24. The program met my expectations	3.4	6	21	6	7	0
25. I have no guide for future action	1.5	0	3	5	25	7
26. Too much time was devoted to trivial matters.	1.4	1	2	4	22	11
27. The information presented was too advanced. .	1.6	1	6	3	25	5
28. The content presented was not applicable to research in vo-ed	1.3	1	1	3	22	13
29. Seminars of this nature should be offered again in the future	4.2	24	12	4	0	0
30. Seminars such as this will contribute little to vo-ed research	0.9	0	0	4	14	22

Attitudes. The data presented in Table 16 are the pretest and posttest means for this seminar, and the mean for, all seminars, giving equal weight to each seminar. Figure 3 represents the direction and magnitude of change (in hundredths of a point) from pretest to posttest. The reader must consider the table and the chart together as well as the relationship between the item means for this seminar and the item means over all the seminars. (It must also be noted that the direction of change from pretest to posttest response for the two negative items, i.e., invalidity and contamination, have been inverted so as to be consistent with the 28 positive items.)

As was the case in presenting the data derived from the Satisfactions evaluation form, only the highlights of these data will be presented below. It is suggested that study of the data presented in both the table and chart will be most informative.

The research terms receiving a mean posttest response of 6 or more were sampling, applied research, research design, experimental research, and reliability. The terms receiving less than 5 on the posttest were non-parametric and diffusion research, in addition to the negative terms of contamination and invalidity.

The direction of change for this seminar as shown in the chart is largely in the positive direction, with 11 terms showing a slight negative change. The term of greatest positive change was nominal scaling.

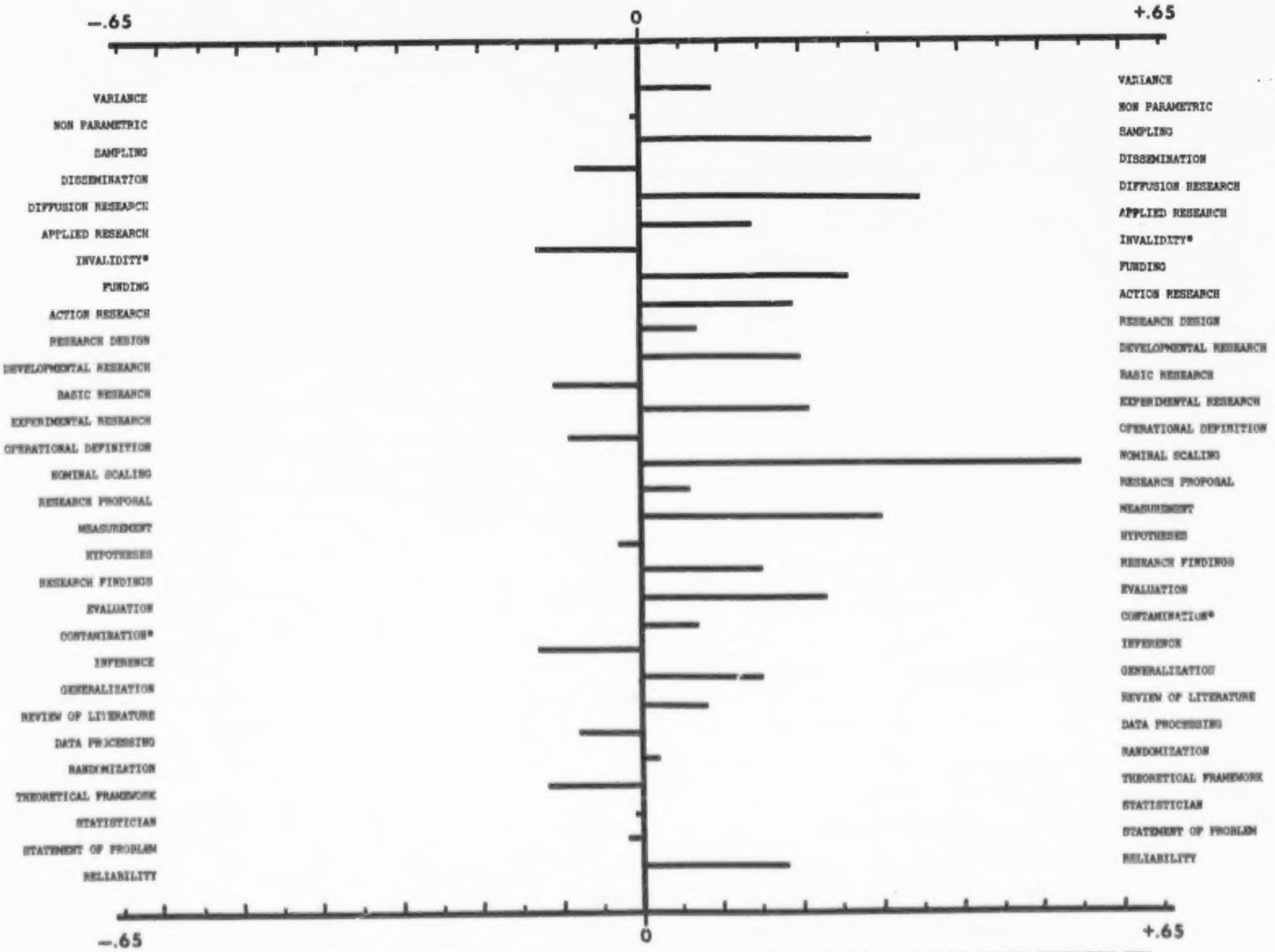

Figure 3. DIRECTION AND MAGNITUDE OF CHANGE FROM PRETEST TO POSTTEST IN MEAN RESPONSES TO 30 RESEARCH TERMS PRESENTED IN THE SEMANTIC DIFFERENTIAL FORM

- COLORADO SEMINAR -

*A negative change in direction for the two negative terms are presented as a positive change whereas a positive change is presented in the negative direction.

Table 16. Change in Attitudes toward Research Terms

- Colorado Seminar -

Research Term	Mean			
	Colorado		All Seminars	
	Pretest	Posttest	Pretest	Posttest
Variance	5.23	5.32	5.272	5.315
Non Parametric	4.97	4.96	4.794	4.905
Sampling	5.75	6.04	5.748	5.828
Dissemination	5.92	5.84	6.014	5.955
Diffusion Research	4.61	4.96	4.764	5.003
Applied Research	6.03	6.17	6.032	5.965
Invalidity	2.66	2.79	3.044	3.153
Funding	5.30	5.56	5.450	5.785
Action Research	5.45	5.64	5.674	5.763
Research Design	6.07	6.14	5.790	5.770
Developmental Research	5.66	5.86	5.756	5.766
Basic Research	5.90	5.79	5.712	5.703
Experimental Research	5.97	6.18	5.956	6.040
Operational Definition	5.69	5.60	5.480	5.608
Nominal Scaling	4.61	5.16	4.726	4.956
Research Proposal	5.64	5.70	5.572	5.620
Measurement	5.67	5.97	5.808	5.751
Hypotheses	5.92	5.59	5.670	5.688
Research Findings	5.79	5.94	5.800	5.746
Evaluation	5.71	5.94	5.760	5.771
Contamination	2.71	2.64	2.944	2.958
Inference	5.44	5.31	5.266	5.216
Generalization	5.30	5.45	5.276	5.326
Review of Literature	5.60	5.69	5.620	5.593
Data Processing	5.85	5.77	5.746	5.753
Randomization	5.67	5.69	5.354	5.596
Theoretical Framework	5.80	5.68	5.734	5.505
Statistician	5.79	5.78	5.462	5.578
Statement of Problem	5.90	5.88	5.924	5.851
Reliability	5.89	6.07	5.742	5.871

Applied vs. Basic Research Orientation. The data in Tables 17 and 18 give the frequency of responses to each of three questions which were given to participants both in pretest and postttest. The tables also indicate the mean response per question for this group, as well as the mean response for all seminars, giving equal weight to seminars.

Table 17 indicates little change in any of the three questions concerning orientation of the organizations or the participants. The results again show, however, that the participants prefer their organization to be concerned with more basic work than at present and also that the participants personally prefer an even more basic orientation.

The data in Table 18 indicates a slight shift toward the more scientific approach in questions one and two. The responses to question 3, however, show a shift to more importance being given to the chance to serve people.

Table 17. Means and Frequency Distribution of Responses to Lazarsfeld's Form of Applied vs. Basic Research Orientation

- Colorado Seminar -

A. Where would you locate the orientation or prime concern of the organization with which you are presently working?

		Response Frequency						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	Colorado	All Seminars
Pretest		3	11	2	1	1		2.2	2.16
Posttest		1	11	5	1	0		2.4	2.15

B. Where on the same continuum would you prefer the orientation of your organization to be located?

		Response Frequency						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	Colorado	All Seminars
Pretest		2	7	6	2	1		2.6	2.66
Posttest		2	9	6	1	0		2.3	2.40

C. Where on this continuum would you like to do research?

		Response Frequency						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	Colorado	All Seminars
Pretest		1	8	4	2	3		2.9	2.54
Posttest		1	8	5	4	0		2.7	2.61

Table 18. Means and Frequency Distributions of Responses to Storer's Scale of Basic vs. Applied Research Orientation

- Colorado Seminar -

A. If you had to choose between reporting your research in a popular publication where laymen would see it and perhaps use your findings, or reporting it in a scientific journal, which would you prefer?

			Means			
	Distribution		Colorado		All Seminars	
Response	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Definitely popular publication	6	3	2.8	3.2	2.96	2.95
Somewhat popular publication	5	5				
I can't make up my mind	0	0				
Somewhat scientific journal	5	10				
Definitely scientific journal	4	2				

B. If it ever came to a choice between working on the practical problems of vocational education (problems important to the local schools), or contributing to the development of a body of scientific knowledge, which would you prefer to do?

			Means			
	Distribution		Colorado		All Seminars	
Response	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Definitely practical problems	6	6	2.8	3.0	2.74	2.51
Somewhat practical problems	2	2				
I can't make up my mind	0	0				
Somewhat scientific knowledge	7	10				
Definitely scientific knowledge	5	2				

C. How important to you in a job is the chance to serve people, i.e., to help solve their problems?

			Means			
	Distribution		Colorado		All Seminars	
Response	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Of utmost importance	7	9	1.9	1.8	1.60	1.55
Very important	9	7				
Somewhat important	3	4				
Not very important	1	0				
Unimportant	0	0				

Occupational Mobility and Migration

- North Carolina -

Program

This research seminar was conducted at North Carolina State University, April 18-22, 1966 with Harry Beard serving as Director for the host university.

The planning committee, with the help of three consultants, met several weeks before the seminar to plan and develop objectives and program content, and to coordinate the various presentations. Topics particularly pertinent to vocational educators were: (1) problems and decisions facing educational policy makers, program planners, and administrators because of occupational mobility and migration, (2) a conceptual framework for studying socio-economic mobility, (3) the status of research, (4) research rationales, designs, and methodology for the problem area, (5) areas and researchable problems, and (6) resources available to conduct research and disseminate findings.

The stage was set for the seminar by Rupert Evans' speech entitled, "The Need for Research and Its Utilization in Local, Regional and State Systems of Education." H. M. Hamlin followed with his reactions and support of Evans' talk. Attendants were further prepared for the study of occupational mobility and migration by a paper entitled, "Manpower Adjustments and Occupational Education," by E. Walton Jones, North Carolina State University. In the preparation of the paper, Jones compiled information on: manpower adjustments to economic growth, demand for manpower, the changing location of jobs, the supply of manpower, long-run changes, the mobility of the work force and the factors influencing it, gaps in mobility, manpower research, and the role of occupational education. Next, a series of papers was presented on topics by consultants as listed below:

Manpower Supply in the United States	Howard Rosen Office of Manpower Policy, Evaluation and Research U.S. Department of Labor
Manpower Requirements by Industry and Occupations	Sol Swerdloff Bureau of Labor Statistics U.S. Department of Labor
The Role of Spatial Mobility in Occupational Change	Everett S. Lee Population Studies Center University of Pennsylvania
The Social-Psychological Dimension of Occupational Mobility	William P. Kuvlesky Professor of Rural Sociology Texas A and M University
Understanding Social Mobility	Selz C. Mayo, Head Department of Sociology North Carolina State University

The next major activity of the seminar was to divide the participants into five workshop groups. A group was assigned to each of the following: (1) Manpower supply, (2) manpower requirements, (3) migration, (4) social-psychological dimensions of occupational mobility, and (5) socio-economic mobility. Each session was advised by the consultant who had given the presentation on the topic. On the last day a report of the deliberations of each group was presented before all the participants. The Seminar Director assembled the five interest-group reports into the 38-page mimeograph summary entitled, "Seminar on Occupational Mobility and Migration - Report of Interest Groups." This was distributed to participants in early June 1966. A final report for this seminar entitled, "Occupational Mobility and Migration - Proceedings of a Vocational Education Research Seminar" was printed and distributed in August 1966.

As indicated earlier, a comparatively small number of vocational educators originally expressed interest in occupational mobility and migration. The interest, expressions and participation of those in the seminar, however, would indicate this to be an area of vital concern to vocational educators. Further, it may be stated that many vocational education leaders and those in research positions should pursue the subject because of its profound implications upon vocational education.

Evaluation

Satisfactions. The data presented in Table 19 represent the frequency distribution and median for each of the thirty statements of the Satisfactions evaluation form. One-half of these statements were presented in the positive form, with the others in the negative form. Rather than presenting a lengthy discussion of all these data it is advised that the reader study the distribution of responses as well as the median for each of the statements. The following will therefore mention only the major points of interest.

In this seminar, agreement was indicated for each positive statement and disagreement for each negative statement. The greatest agreement was given to positive statements 7, 23 and 29. The greatest disagreement resulted concerning negative statements 6, 8 and 30.

Knowledge. The data presented in Table 20 gives the distribution of change in scores from pretest to posttest. The first row gives the frequency of change for scores computed on items which appeared on both the participants' pretest and posttest. The second row gives the frequency of change from the participants' pretest score to the score for all items on the posttest. Also appearing in the table is the distribution of posttest scores.

There were 22 participants in this seminar who showed a gain in scores between pretest and the same-item posttest. Five showed a loss. The distribution of change was similar between scores in pretest and total-item posttest, with 20 gaining, 6 remaining the same, and 6 showing a loss.

There was one participant who scored in the 90's for the total-item posttest, with a total of 21 receiving at least a 60.

Table 20. Change in Content Knowledge Scores from Pretest to Posttest

- North Carolina Seminar -

	Number of Persons Showing					
	Decreased Score	No Change	Increased Score by:			
			10%	20%	30%	40% or more
Change in scores for items on both pretest and posttest	5	5	9	5	6	2
Change in scores from both pretests to all items on the posttest.	6	6	11	2	7	0

Frequency Distribution of Posttest Scores

Percentage score	01-19%	20-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-89%	90-99%
Frequency	6	6	11	2	7	0			

Table 19. Median and Frequency Distribution
for Degree of Agreement with Statements of Satisfaction

- North Carolina Seminar -

Statements	Median	Frequency Distribution				
		Strongly Agree (5)	Agree (4)	Un-decided (3)	Dis-agree (2)	Strongly Disagree (1)
In regard to this conference I feel that:						
1. The purposes of this program were clear to me.	3.5	5	23	2	2	0
2. The objectives of this program were not realistic.	1.6	1	6	1	17	7
3. Specific purposes made it easy to work efficiently.	3.0	4	12	10	6	0
4. The participants accepted the purposes of this program.	3.5	6	20	4	2	0
5. The objectives of this program were not the same as my objectives.	1.8	2	6	3	19	2
6. I didn't learn anything new.	0.7	0	0	0	7	25
7. The material presented was valuable to me.	4.1	18	13	0	1	0
8. I could have learned as much by reading a book	0.8	0	0	0	12	20
9. Possible solutions to my problems were considered	3.3	4	16	7	3	2
10. The information presented was too elementary	1.2	0	0	0	20	12
11. The speakers really knew their subjects.	3.9	14	16	1	1	0
12. The discussion leaders were not well prepared.	1.7	3	7	2	10	10
13. I was stimulated to think objectively about the topics presented	3.6	9	17	4	2	0
14. New acquaintances were made which will help in future research.	3.9	14	15	3	0	0
15. We worked together as a group.	3.8	12	17	2	1	0
16. We did not relate theory to practice	1.8	3	6	4	12	7
17. The sessions followed a logical pattern.	3.6	7	20	3	1	1
18. The schedule was too fixed	1.6	2	5	2	18	5
19. The group discussions were excellent	3.6	10	14	4	4	0
20. There was very little time for informal conversation	1.4	0	1	1	23	7
21. I did not have an opportunity to express my ideas.	1.3	2	1	1	16	12
22. I really felt a part of this group	3.7	10	20	2	0	0
23. My time was well spent	4.1	17	13	1	1	0
24. The program met my expectations.	3.5	7	18	4	2	1
25. I have no guide for future action.	1.2	0	1	2	16	13
26. Too much time was devoted to trivial matters	1.2	0	1	0	17	14
27. The information presented was too advanced	1.4	0	5	0	17	10
28. The content presented was not applicable to research in vo-ed.	1.5	0	1	3	21	7
29. Seminars of this nature should be offered again in future years.	4.4	26	6	0	0	0
30. Seminars such as this will contribute little to vo-ed research.	0.7	0	0	0	9	23

Attitudes. The data presented in Table 21 are the pretest and posstest means for this seminar and the means for all seminars, giving equal weight to each seminar. Figure 4 represents the direction and magnitude of change, in hundredths of a point, from pretest to posttest. The reader must consider the table and the chart together as well as the relationship between the item means for this seminar and the item means for all the seminars. (It must also noted that the direction of change from pretest to posttest response for the two negative items, i.e., invalidity and contamination, have been inverted so as to be consistent with the 28 positive items.)

As was the case in presenting the data derived from the Satisfactions evaluation form, only the highlights of these data will be presented below. It is suggested that study of the data presented in both the table and chart will be most informative.

This seminar had 14 research terms on the pretest which received an average response lower than any other seminar. Of the thirty response means, 25 were lower than the mean computed for all seminars. This might indicate a regression toward the mean in a manner opposite that of the Georgia seminar.

The research terms receiving a mean posttest response of more than 6 were dissemination, applied research, and action research. The terms with a mean of less than 5 on the posttest were non-parametric, nominal scaling, and generalization, in addition to the two negative terms of invalidity and contamination.

The change as shown in the chart is in the positive direction, but as mentioned above this may be attributable largely to the statistical artifact of regression toward the mean. The terms receiving greatest positive shift are diffusion research and funding. The term theoretical framework exhibited the greatest negative change.

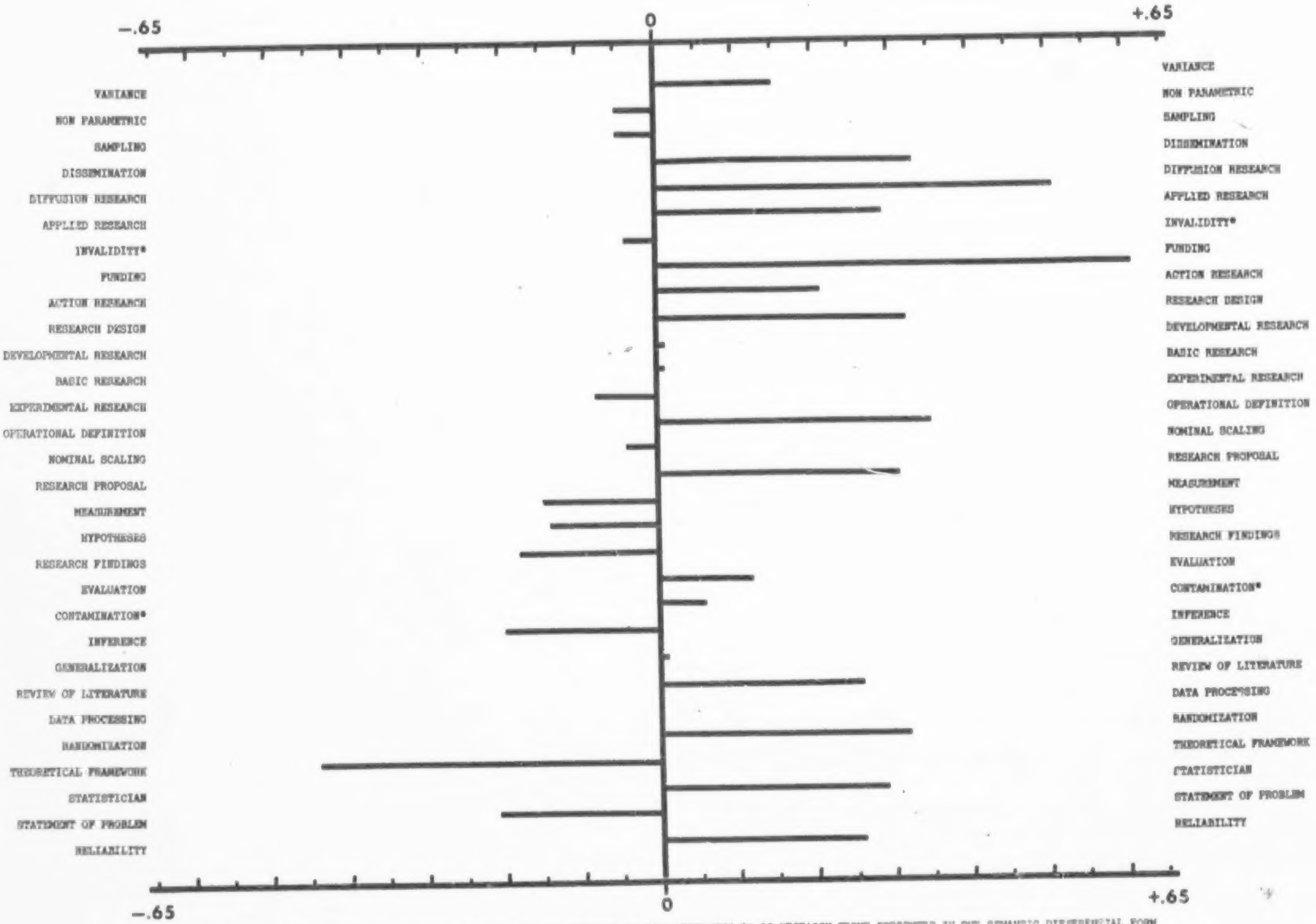

Figure 4. DIRECTION AND MAGNITUDE OF CHANGE FROM PRETEST TO POSTTEST IN MEAN RESPONSES TO 30 RESEARCH TERMS PRESENTED IN THE SEMANTIC DIFFERENTIAL FORM

- NORTH CAROLINA SEMINAR -

*A negative change in direction for the two negative terms are presented as a positive change whereas a positive change is presented in the negative direction.

Table 21. Change in Attitudes toward Research Terms

- North Carolina Seminar -

	Mean			
	North Carolina		All Seminars	
Research Term	Pretest	Posttest	Pretest	Posttest
Variance	5.07	5.22	5.272	5.315
Non Parametric	4.77	4.72	4.794	4.905
Sampling	5.73	5.68	5.748	5.828
Dissemination	5.76	6.09	6.014	5.955
Diffusion Research	4.88	5.39	4.764	5.003
Applied Research	5.78	6.07	6.032	5.965
Invalidity	2.91	2.95	3.044	3.153
Funding	5.07	5.68	5.450	5.785
Action Research	5.81	6.02	5.674	5.763
Research Design	5.21	5.53	5.790	5.770
Developmental Research	5.72	5.73	5.756	5.766
Basic Research	5.48	5.49	5.712	5.703
Experimental Research	5.85	5.77	5.956	6.040
Operational Definition	5.23	5.58	5.480	5.608
Nominal Scaling	4.91	4.95	4.726	4.956
Research Proposal	5.23	5.54	5.572	5.620
Measurement	5.78	5.63	5.808	5.751
Hypotheses	5.64	5.50	5.670	5.688
Research Findings	5.72	5.54	5.800	5.746
Evaluation	5.55	5.67	5.760	5.771
Contamination	3.07	3.01	2.944	2.958
Inference	5.10	5.00	5.266	5.216
Generalization	4.94	4.95	5.276	5.326
Review of Literature	5.14	5.40	5.620	5.593
Data Processing	5.72	5.72	5.746	5.753
Randomization	5.05	5.37	5.354	5.596
Theoretical Framework	5.60	5.16	5.734	5.505
Statistician	5.19	5.48	5.462	5.578
Statement of Problem	5.95	5.74	5.924	5.851
Reliability	5.53	5.79	5.742	5.871

Applied vs. Basic Research Orientation. The data in Tables 22 and 23 give the frequency of responses to each of three questions which were given to participants both in pretest and posttest. The tables also indicate the mean response per question for this group as well as the mean response for all seminars, giving equal weight to each seminar.

The only question showing change of any appreciable magnitude from pretest to posttest in Table 22 is question 2 concerning the preferred orientation of the participant's organization. Here the shift was away from basic, and toward applied. The posttest means indicate again that the participants prefer to do research which is more basic than they would have their organizations undertake, and also that their organizations presently are concerned with work which is more applied than they would prefer.

According to the data shown in Table 23 three participants changed from reporting their research in a definitely popular publication to a somewhat more scientific journal. The shift was in the opposite direction for the problems they would prefer to work on, while very little shift occurred in their desire to serve people.

Table 22. Means and Frequency Distribution of Responses to Lazarsfeld's Form Applied vs. Basic Research Orientation

- North Carolina Seminar -

A. Where would you locate the orientation or prime concern of the organization with which you are presently working?

		Response Frequency						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	N. Carolina	All Seminars
Pretest		4	6	3	1	0		1.9	2.16
Posttest		5	7	2	0	0		1.8	2.15

B. Where on the same continuum would you prefer the orientation of your organization to be located?

		Response Frequency						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	N. Carolina	All Seminars
Pretest		1	6	5	1	1		2.6	2.66
Posttest		2	9	3	0	0		2.1	2.40

C. Where on this continuum would you like to do research?

		Response Frequency						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	N. Carolina	All Seminars
Pretest		3	4	6	0	1		2.4	2.54
Posttest		2	7	4	1	0		2.3	2.61

Table 23. Means and Frequency Distributions of Responses to Storer's Scale of Basic vs. Applied Research Orientation

- North Carolina Seminar -

A. If you had to choose between reporting your research in a popular publication where laymen would see it and perhaps use your findings, or reporting it in a scientific journal, which would you prefer?

			Means			
	Distribution		North Carolina		All Seminars	
Response	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Definitely popular publication	7	4	2.5	2.9	2.96	2.95
Somewhat popular publication	4	5				
I can't make up my mind	0	1				
Somewhat scientific journal	2	3				
Definitely scientific journal	4	4				

B. If it ever came to a choice between working on the practical problems of vocational education (problems important to the local schools), or contributing to the development of a body of scientific knowledge, which would you prefer to do?

			Means			
	Distribution		North Carolina		All Seminars	
Response	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Definitely practical problems	8	7	2.4	2.1	2.74	2.51
Somewhat practical problems	4	7				
I can't make up my mind	0	0				
Somewhat scientific knowledge	1	0				
Definitely scientific knowledge	4	3				

C. How important to you in a job is the chance to serve people, i.e., to help solve their problems?

			Means			
	Distribution		North Carolina		All Seminars	
Response	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Of utmost importance	11	9	1.5	1.6	1.60	1.55
Very important	3	6				
Somewhat important	3	2				
Not very important	0	0				
Unimportant	0	0				

Research Design

- Cornell -

Program

This seminar was conducted at Cornell University, May 2-6, 1966, with Frederick Tom serving as Seminar Director. The number of applicants for the research design seminar continued to be greater than could be accommodated. A very large percentage of the applicants accepted invitations, with 39 attending, plus five staff from the U.S. Office of Education.

In the three previous years, a similar seminar had been conducted. The good features of the preceding programs were incorporated in this seminar, with emphasis on experimental design. Two consultants used the major part of the available time for a detailed discussion of (1) experimental research and proposal-writing and (2) statistical tools and analysis of variance. The major topics, and consultants for each, follow:

The Role of Experimental Research in Vocational Education	Jason Millman School of Education Cornell University
Some Perspectives on the Research Process	David Krathwohl, Dean School of Education Syracuse University
The Research Process and Its Implication for Proposal Writing	David Krathwohl
The Preparation of Research Proposals and the Design of Experimental Research	David Krathwohl
The Arithmetic of Analysis of Variance	Donald G. MacEachern College of Education University of Minnesota
Topics in the Analysis of Variance	Donald G. MacEachern
Sampling Procedures in Research	Donald G. MacEachern
The Analysis of Variance in Research	Donald G. MacEachern
Current Research Developments in The U.S. Office of Education	Sidney High Specialist in Research U.S. Office of Education
Latest Developments in Computer Science with Implications for the Educational Researcher	Karl L. Zinn Center for Research on Learning and Teaching University of Michigan

Four small group sessions studied four selected research proposals in vocational education. These sessions were conducted by Eunice Jones, Sherrill McMillen, Virginia Thomas and Jack Wilson of the U.S. Office of Education.

One morning was spent to present experimental studies being conducted in Nebraska, Pennsylvania, Minnesota and George Washington University by John Coster, Elizabeth Ray, David Pucel and John Dailey, respectively.

The last highlight on the seminar program was a review of research proposals submitted by seminar participants. Sidney High served as Chairman of a panel including Donald MacEachern, Sara Blackwell, Harold Cushman and D. Bob Gowin. The outcome of this activity may be best described by saying that the time available was entirely too short to permit answering all the questions of the participants and to let them express their reactions to review procedures.

Evaluation

Satisfactions. The data presented in Table 24 represent the frequency distribution and median for each of the thirty statements of the Satisfactions evaluation form. One-half of these statements were presented in the positive form with the others in the negative form. Rather than presenting a lengthy discussion of all these data it is suggested that the reader study the distribution of responses as well as the median for each of the statements. The following will therefore mention only the highlights.

A high degree of agreement resulted for each positive statement, and a high degree of disagreement for each negative statement presented to this seminar group. The positive statements resulting in a median of 4 or more were 1, 7, 11, 14, 23, 24 and 29. The negative statements having a median response of less than 1 were 6, 8, 26, 28 and 30.

Knowledge. The data presented in Table 25 gives the distribution of changes in scores from pretest to posttest. The first row gives the frequency of changes for scores computed on items which appeared both on the participants' pretest and posttest. The second row gives the frequency of changes from the participants' pretest score to the score for all items on the posttest. Also shown in this table is the distribution of posttest scores.

A total of 27 participants increased their scores on the items which appeared on both their pretest and posttest forms. There were, however, 9 with no change and 7 with lower scores. The distribution of changes between pretest and all item posttest scores was very similar, with 16 again showing no change or a loss, while 27 gained.

The highest scores were in the 80's, with most participants scoring between 50% and 69%.

Table 25. Change in Content Knowledge Scores from Pretest to Posttest

- Cornell Seminar -

	Number of Persons Showing					
	Decreased Score	No Change	Increased Score by:			
			10%	20%	30%	40% or more
Change in scores for items on both pretest and posttest	7	9	14	5	6	2
Change in scores from both pretests to all items on the posttest.	8	8	11	10	3	3

Frequency Distribution of Posttest Scores

Percentage score	01-19%	20-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-89%	90-99%
Frequency	0	0	1	7	15	11	7	3	0

Table 24. Median and Frequency Distribution
for Degree of Agreement with Statements of Satisfaction

- Cornell Seminar -

		Frequency Distribution				
Statements	Median	Strongly Agree (5)	Agree (4)	Un-decided (3)	Dis-agree (2)	Strongly Disagree (1)
In regard to this conference I feel that:						
1. The purposes of this program were clear to me.	4.0	22	22	0	0	0
2. The objectives of this program were not realistic.	1.1	1	3	1	19	20
3. Specific purposes made it easy to work efficiently.	3.6	10	31	1	2	0
4. The participants accepted the purposes of this program	3.8	16	27	0	1	0
5. The objectives of this program were not the same as my objectives.	1.2	2	0	3	21	18
6. I didn't learn anything new.	0.7	1	1	0	9	33
7. The material presented was valuable to me.	4.1	25	18	1	0	0
8. I could have learned as much by reading a book	0.8	1	1	0	14	28
9. Possible solutions to my problems were considered	3.5	6	31	7	0	0
10. The information presented was too elementary	1.3	1	1	2	24	16
11. The speakers really knew their subjects.	4.2	28	16	0	0	0
12. The discussion leaders were not well prepared.	1.4	0	1	5	24	14
13. I was stimulated to think objectively about the topics presented	3.9	18	24	1	1	0
14. New acquaintances were made which will help in future research	4.1	23	19	2	0	0
15. We worked together as a group.	3.8	15	27	2	0	0
16. We did not relate theory to practice	1.4	0	3	2	27	12
17. The sessions followed a logical pattern.	3.9	20	23	1	0	0
18. The schedule was too fixed	1.3	1	2	6	17	18
19. The group discussions were excellent	3.5	10	23	6	5	0
20. There was very little time for informal conversation	1.4	1	3	2	24	14
21. I did not have an opportunity to express my ideas.	1.1	0	0	1	24	19
22. I really felt a part of this group	3.9	19	22	1	2	0
23. My time was well spent	4.3	30	13	0	1	0
24. The program met my expectations.	4.0	21	19	3	0	1
25. I have no guide for future action.	1.0	0	0	2	20	22
26. Too much time was devoted to trivial matters	0.9	0	1	1	16	26
27. The information presented was too advanced	1.6	0	5	6	23	10
28. The content presented was not applicable to research in vo-ed.	0.9	0	0	2	18	24
29. Seminars of this nature should be offered again in future years.	4.4	36	7	0	1	0
30. Seminars such as this will contribute little to vo-ed research.	0.6	1	0	0	9	34

Attitudes. The data presented in Table 26 are the pretest and posttest means for this seminar and the means for all seminars giving equal weight to each seminar. Figure 5 represents the direction and magnitude of change, in hundredths of a point, from pretest to posttest. The reader must consider the table and the chart together as well as the relationship between the item means for this seminar and item means for all the seminars. (It must also be noted that the direction of change from pretest to posttest response for the two negative items, i.e., invalidity and contamination, have been inverted so as to be consistent with the 28 positive items.)

As was the case in presenting the data derived from the Satisfactions evaluation form, only the highlights of these data will be presented below. It is suggested that study of the data presented in both the table and chart will be most informative.

In this seminar only nine research terms received a pretest mean lower than the mean for all seminars. As shown by the chart, however, the shift from pretest to posttest was in a positive direction.

The research terms receiving a posttest mean response of 6 or more were: dissemination, applied research, research design, experimental research, research findings, evaluation, review of literature, randomization, statement of problem, and reliability. The terms receiving less than 5 on the posttest were: non-parametric, diffusion research, and nominal scaling, in addition to the two negative terms.

The direction of change from pretest to posttest was certainly in the positive direction with only the term of data processing showing a negative shift of any great magnitude. The terms with greatest positive shift were action research, hypotheses, and randomization.

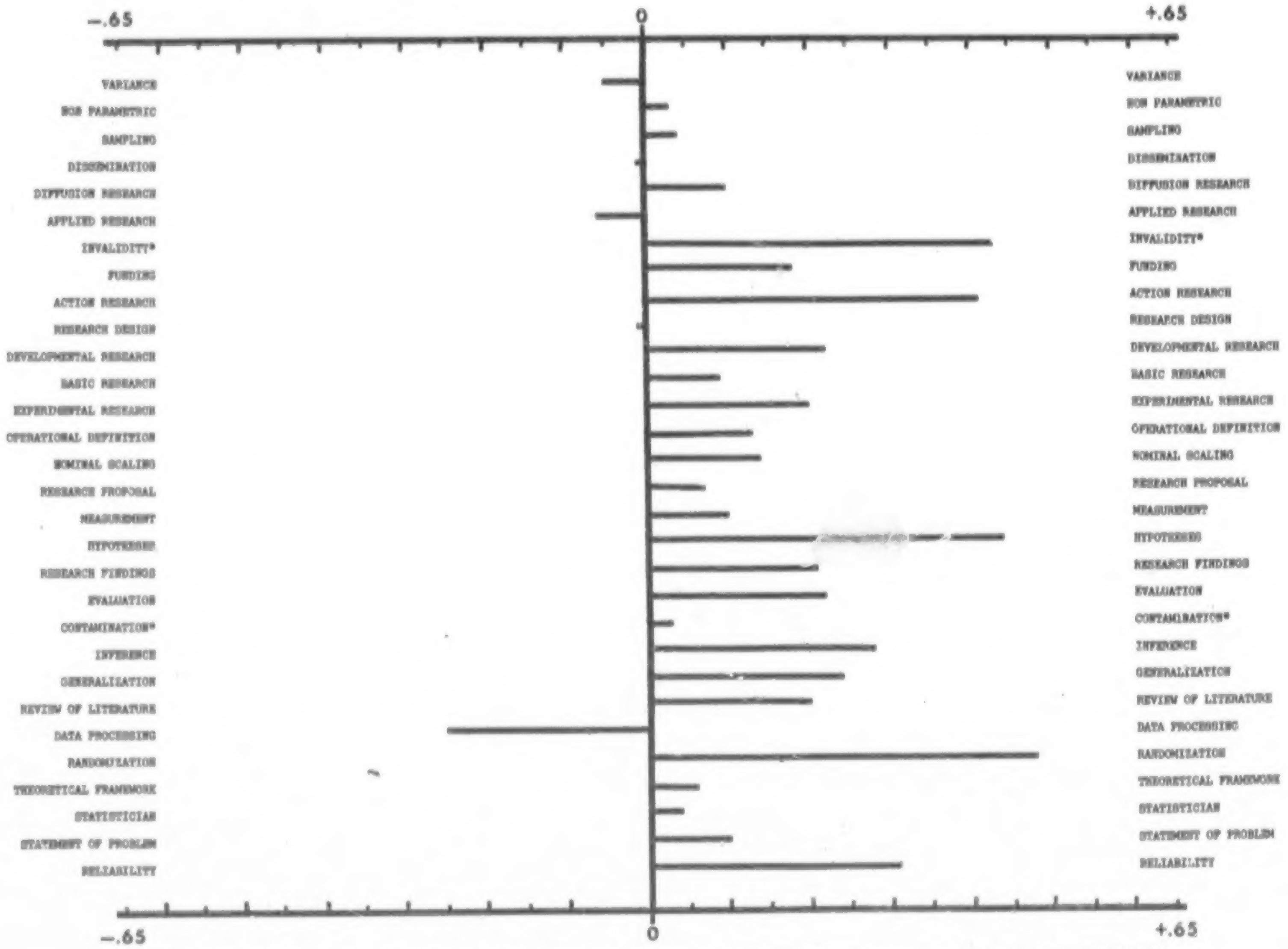

Figure 5. DIRECTION AND MAGNITUDE OF CHANGE FROM PRETEST TO POSTTEST IN MEAN RESPONSES TO 30 RESEARCH TERMS PRESENTED IN THE SEMANTIC DIFFERENTIAL FORM

- CORNELL SEMINAR -

*A negative change in direction for the two negative terms are presented as a positive change whereas a positive change is presented in the negative direction.

Table 26. Change in Attitudes toward Research Terms

- Cornell Seminar -

Research Term	Mean			
	Cornell		All Seminars	
	Pretest	Posttest	Pretest	Posttest
Variance	5.33	5.28	5.272	5.315
Non Parametric	4.82	4.85	4.794	4.905
Sampling	5.80	5.84	5.748	5.828
Dissemination	6.03	6.02	6.014	5.955
Diffusion Research	4.70	4.80	4.764	5.003
Applied Research	6.26	6.20	6.032	5.965
Invalidity	3.32	2.89	3.044	3.153
Funding	5.69	5.87	5.450	5.785
Action Research	5.55	5.96	5.674	5.763
Research Design	6.10	6.09	5.790	5.770
Developmental Research	5.72	5.94	5.756	5.766
Basic Research	5.85	5.94	5.712	5.703
Experimental Research	5.94	6.14	5.956	6.040
Operational Definition	5.59	5.72	5.480	5.608
Nominal Scaling	4.69	4.83	4.726	4.956
Research Proposal	5.73	5.82	5.572	5.620
Measurement	5.82	5.92	5.808	5.751
Hypotheses	5.46	5.99	5.670	5.688
Research Findings	5.89	6.10	5.800	5.746
Evaluation	5.84	6.06	5.760	5.771
Contamination	3.02	2.99	2.944	2.958
Inference	5.09	5.37	5.266	5.216
Generalization	5.26	5.50	5.276	5.326
Review of Literature	5.80	6.00	5.620	5.593
Data Processing	5.86	5.[illegible]1	5.746	5.753
Randomization	5.33	6.01	5.354	5.596
Theoretical Framework	5.79	5.85	5.734	5.505
Statistician	5.55	5.64	5.462	5.578
Statement of Problem	5.98	6.08	5.924	5.851
Reliability	5.75	6.06	5.742	5.871

Applied vs. Basic Research Orientation. The data in Tables 27 and 28 give the frequency of responses to each of three questions which were given to participants both in pretest and posttest. The tables also indicate the mean response per question for this group, as well as the mean response for all seminars, giving equal weight to each seminar.

The participants in this seminar also indicated on the posttest that their personal preference for research was more basic than the preferred orientation of their organization, which in turn was more basic than its actual orientation. The largest shift from pretest to posttest occurred on question 3, which indicated a change of preference toward basic research.

There seems to be no change in the type of publication in which participants would prefer to report their research, as indicated in Table 28. There was, however, a slight shift toward practical problems in question 2. The chance to serve people, as indicated by question 3, remained very important.

Table 27. Means and Frequency Distribution of Responses to Lazarsfeld's Form of Applied vs. Basic Research Orientation

- Cornell Seminar

A. Where would you locate the orientation or prime concern of the organization with which you are presently working?

		Response Frequency						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	Cornell	All Seminars
Pretest		5	9	8	0	0		2.1	2.16
Posttest		4	7	10	1	0		2.4	2.15

B. Where on the same continuum would you prefer the orientation of your organization to be located?

		Response Frequency						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	Cornell	All Seminars
Pretest		0	10	12	0	0		2.5	2.66
Posttest		3	6	12	1	0		2.5	2.40

C. Where on this continuum would you like to do research?

		Response Frequency						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	Cornell	All Seminars
Pretest		2	12	6	1	0		2.2	2.54
Posttest		4	7	8	2	0		2.7	2.61

Table 28. Means and Frequency Distribution of Responses to Storer's Scale of Basic vs. Applied Research Orientation

- Cornell Seminar -

A. If you had to choose between reporting your research in a popular publication where laymen would see it and perhaps use your findings, or reporting it in a scientific journal, which would you prefer?

	Distribution		Means			
			Cornell		All Seminars	
Response	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Definitely popular publication	2	2	3.3	3.3	2.96	2.95
Somewhat popular publication	5	4				
I can't make up my mind	0	1				
Somewhat scientific journal	11	13				
Definitely scientific journal	2	0				

B. If it ever came to a choice between working on the practical problems of vocational education (problems important to the local schools), or contributing to the development of a body of scientific knowledge, which would you prefer to do?

	Distribution		Means			
			Cornell		All Seminars	
Response	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Definitely practical problems	6	4	3.0	2.7	2.74	2.51
Somewhat practical problems	4	7				
I can't make up my mind	0	1				
Somewhat scientific knowledge	7	9				
Definitely scientific knowledge	4	0				

C. How important to you in a job is the chance to serve people, i.e., to help solve their problems?

	Distribution		Means			
			Cornell		All Seminars	
Response	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Of utmost importance	10	7	1.5	1.4	1.60	1.55
Very important	11	12				
Somewhat important	0	2				
Not very important	0	0				
Unimportant	0	0				

Curriculum Evaluation

- Illinois -

Program

The Curriculum Evaluation Seminar was held at the University of Illinois, May 16-20, 1966, with William Schill serving as Seminar Director. Interest and expectations were high for this seminar as indicated by the large number of applicants and by the fact that all of those invited, accepted. Shortly before the seminar began, three individuals reported that they could not attend. Persons on the alternate list were also not able to come. The original purpose of the seminar was to explore and discuss variables and paradigms related to the assessment of curricular offerings in vocational education.

The program followed a rigid pattern of presenting major papers, with one to three individuals giving responses. Afterwards the participants had an opportunity to ask questions or to make comments. Before the seminar, the Seminar Director had obtained copies of the major speeches and of most of the responses, and had duplicated copies for distribution to the participants at the beginning of the seminar.

One half-day was scheduled for each major presentation with its responses, followed by questions and discussion. The topics and speakers were:

Problems and Prospects in Vocational Education	Harry Browdy College of Education University of Illinois
Sociology and Curriculum Evaluation	David Street Department of Sociology University of Chicago
Criterion Problems and Curriculum Evaluation	Donald Leton Bureau of Educational Research University of Hawaii
Psychological Aspect of Curriculum Evaluation	David Ausubel College of Education University of Illinois
The Countenance of Educational Evaluation	Robert Stake College of Education University of Illinois
Evaluation Problems of the UICSM Curriculum Project	John Easley, Jr. College of Education University of Illinois
Administrative Aspects of Curriculum Evaluation	James Lipham School of Education University of Wisconsin

The content of the major presentations served to review curricular research and developmental projects, and was scholarly, philosophical, theoretical, and academic. Easley's presentation on curriculum development and evaluation was a highlight in the program, as it showed much relevance to curriculum development and evaluation in vocational and technical education.

Evaluation

Satisfactions. The data presented in Table 29 represent the frequency distribution and median for each of the thirty statements of the Satisfactions evaluation form. One-half of these statements were presented in the positive form with the others in the negative form. Rather than presenting a lengthy discussion of all these data it is advised that the reader study the distribution of responses as well as the median for each of the statements. The following will therefore mention only the highlights.

In this seminar the median response to positive statements 3, 15, and 19 showed disagreement. The other positive statements received a median response on the agreement end of the continuum. All negative statements had a median falling in the disagreement categories. The only positive statement receiving a median of 4 or better was statement 29. The negative statements 6, 10 and 30 received a median of 1 or less.

Knowledge. The data presented in Table 30 gives the distribution of changes in scores from pretest to posttest. The first row gives the frequency of change for scores computed on items which appeared on both the participants' pretest and posttest. The second row gives the frequency of change from the participants' pretest score to the score for all items on the posttest. This table also presents the distribution of posttest scores.

Here there were 13 participants with a loss or no change between the pretest score and the score on the same items appearing in the posttest. Opposed to this were the 24 persons gaining 10 or more percentage points. The total posttest scores showed 20 persons improving upon their pretest scores, while 10 received lower scores, and 7 remained constant.

The distribution of total item posttest scores ranged from 20% to 79% with most people receiving 50% to 79%.

Table 30. Change in Content Knowledge Scores from Pretest to Posttest

- Illinois Seminar -

	Number of Persons Showing					
	Decreased Score	No Change	Increased Score by: 10%	20%	30%	40% or more
Change in scores for items on both pretest and posttest	6	7	8	4	5	7
Change in scores from both pretests to allitems on the posttest.	10	7	8	6	3	3

Frequency Distribution of Posttest Scores

Percentage score	01-19%	20-29%	30-39%	40-49%	50-59%	60-69%	70-79%	80-89%	90-99%
Frequency	0	1	6	5	10	9	6	0	0

Table 29. Median and Frequency Distribution for Degree of Agreement with Statements of Satisfaction

- Illinois Seminar -

		Frequency Distribution				
Statements	Median	Strongly Agree (5)	Agree (4)	Un-decided (3)	Dis-agree (2)	Strongly Disagree (1)
In regard to this conference I feel that:						
1. The purposes of this program were clear to me.	3.2	3	19	6	8	1
2. The objectives of this program were not realistic.	1.7	0	5	7	17	8
3. Specific purposes made it easy to work efficiently.	2.5	0	12	12	12	1
4. The participants accepted the purposes of this program	3.3	5	19	10	3	0
5. The objectives of this program were not the same as my objectives.	1.9	0	10	5	17	5
6. I didn't learn anything new.	0.8	1	0	0	11	25
7. The material presented was valuable to me. . .	3.9	15	21	1	0	0
8. I could have learned as much by reading a book	1.3	1	0	2	21	13
9. Possible solutions to my problems were considered	3.3	1	26	5	4	1
10. The information presented was too elementary .	0.9	0	1	0	14	22
11. The speakers really knew their subjects. . . .	3.9	17	20	0	0	0
12. The discussion leaders were not well prepared.	1.6	0	1	10	16	10
13. I was stimulated to think objectively about the topics presented	3.7	10	24	1	2	0
14. New acquaintances were made which will help in future research	3.6	11	16	4	4	2
15. We worked together as a group.	2.0	1	13	4	11	8
16. We did not relate theory to practice	1.6	1	9	0	22	5
17. The sessions followed a logical pattern. . . .	3.5	7	23	5	2	0
18. The schedule was too fixed	1.9	5	8	4	17	3
19. The group discussions were excellent	1.9	1	9	7	16	4
20. There was very little time for informal conversation	1.6	4	3	1	25	4
21. I did not have an opportunity to express my ideas.	1.7	0	7	3	24	3
22. I really felt a part of this group	3.3	4	20	6	6	1
23. My time was well spent	3.7	14	16	4	3	0
24. The program met my expectations.	3.3	7	15	4	8	3
25. I have no guide for future action.	1.5	0	2	5	21	9
26. Too much time was devoted to trivial matters .	1.3	0	1	2	22	12
27. The information presented was too advanced . .	1.5	2	1	2	25	7
28. The content presented was not applicable to research in vo-ed.	1.4	0	2	0	26	9
29. Seminars of this nature should be offered again in future years.	4.2	23	9	4	1	0
30. Seminars such as this will contribute little to vo-ed research.	1.0	0	3	1	14	19

Attitudes. The data presented in Table 31 are the pretest and posttest means for this seminar and the means for all seminars, giving equal weight to each seminar. Figure 6 represents the direction and magnitude of change (in hundredths of a point) from pretest to posttest. The reader must consider the table and the chart together as well as the relationship between the item means for this seminar and the item means for all the seminars. (It must also be noted that the direction of change from pretest to posttest response for the two negative items, i.e., invalidity and contamination, have been inverted so as to be consistent with the 28 positive items.)

As was the case in presenting the data derived from the Satisfactions evaluation form, only the highlights of these data will be presented below. It is suggested that study of the data presented in both the table and chart will be most informative.

This seminar had 13 items which were given pretest responses with means lower than any other seminar. It also had 24 items with pretest means less than the overall means. This might then suggest the possibility of another regression toward the mean resulting in many positive changes. This, however, seems not to be the case since there was as much negative shift as positive shift as indicated in the chart.

The only term receiving a posttest mean of 6 or more was experimental research; whereas the terms non-parametric, diffusion research, nominal scaling, and the two negative terms received posttest means less than 5.

The direction of change indicated by the chart seems as much negative as positive with the terms non-parametric, funding, and experimental research showing the greatest positive change. The terms dissemination, research design and evaluation received the greatest negative change.

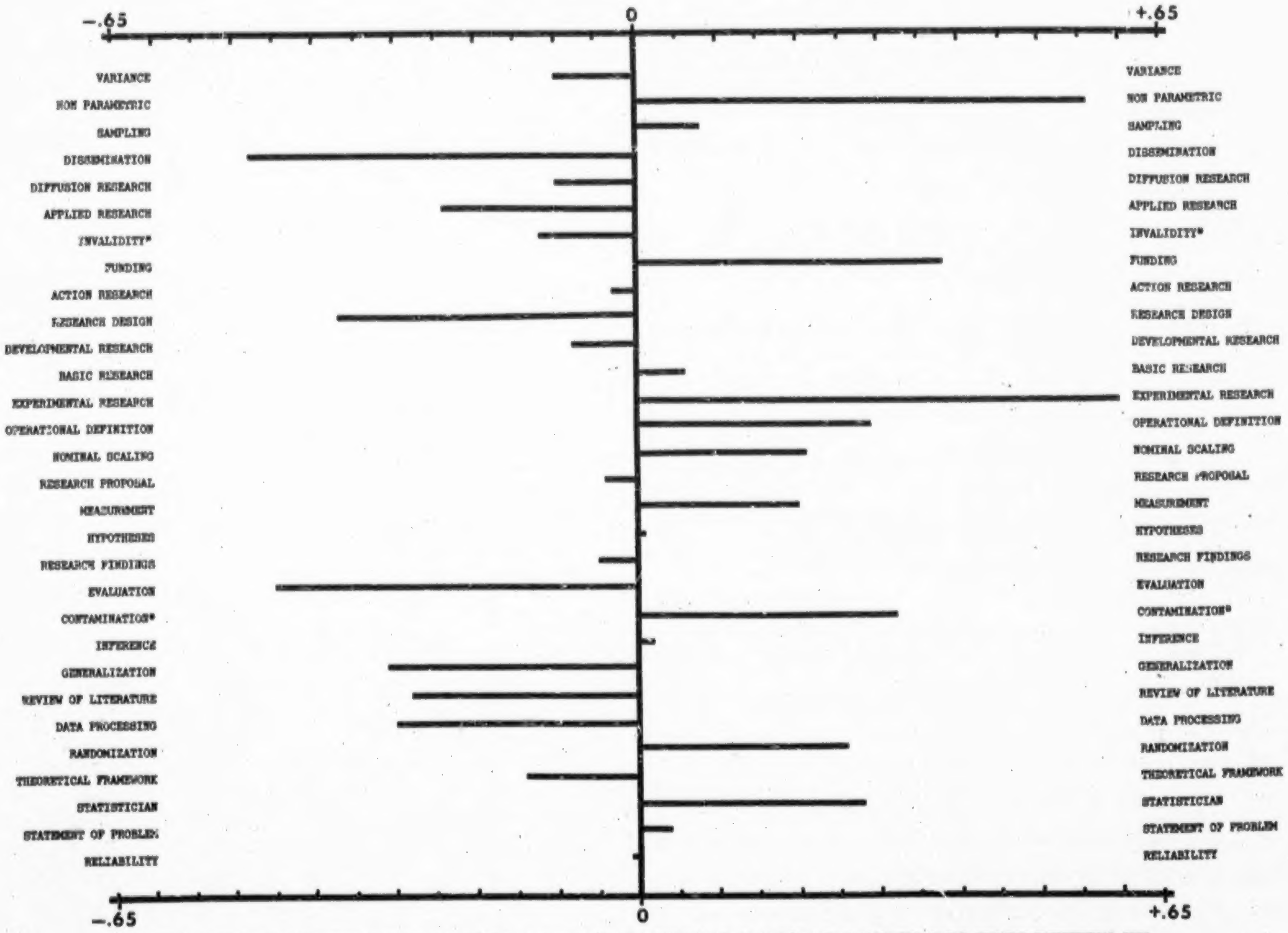

Figure 6. DIRECTION AND MAGNITUDE OF CHANGE FROM PRETEST TO POSTTEST IN MEAN RESPONSES TO 30 RESEARCH TERMS PRESENTED IN THE SEMANTIC DIFFERENTIAL FORM

- ILLINOIS SEMINAR -

*A negative change in direction for the two negative terms are presented as a positive change whereas a positive change is presented in the negative direction.

Table 31. Change in Attitudes toward Research Terms

- Illinois Seminar -

	Mean			
	Illinois		All Seminars	
Research Term	Pretest	Posttest	Pretest	Posttest
Variance	5.25	5.15	5.272	5.315
Non Parametric	4.22	4.78	4.794	4.905
Sampling	5.56	5.64	5.748	5.828
Dissemination	6.27	5.79	6.014	5.955
Diffusion Research	4.82	4.77	4.764	5.003
Applied Research	6.00	5.76	6.032	5.965
Invalidity	3.33	3.45	3.044	3.153
Funding	5.19	5.57	5.450	5.785
Action Research	5.34	5.31	5.674	5.763
Research Design	5.84	5.47	5.790	5.770
Developmental Research	5.67	5.59	5.756	5.766
Basic Research	5.66	5.72	5.712	5.703
Experimental Research	5.81	6.41	5.956	6.040
Operational Definition	5.29	5.58	5.480	5.608
Nominal Scaling	4.60	4.81	4.726	4.956
Research Proposal	5.54	5.50	5.572	5.620
Measurement	5.62	5.72	5.808	5.751
Hypotheses	5.62	5.63	5.670	5.688
Research Findings	5.67	5.62	5.800	5.746
Evaluation	6.13	5.68	5.760	5.771
Contamination	3.34	3.02	2.944	2.958
Inference	5.06	5.08	5.266	5.216
Generalization	5.53	5.22	5.276	5.326
Review of Literature	5.87	5.59	5.620	5.593
Data Processing	5.39	5.69	5.746	5.753
Randomization	5.26	5.52	5.354	5.596
Theoretical Framework	5.43	5.29	5.734	5.505
Statistician	5.26	5.54	5.462	5.578
Statement of Problem	5.63	5.67	5.924	5.851
Reliability	5.73	5.72	5.742	5.871

Applied vs. Basic Research Orientation. The data in Tables 32 and 33 give the frequency of responses to each of three questions which were given to participants both in pretest and posttest. The tables also indicate the mean response per question for this group as well as the mean response for all seminars, giving equal weight to each seminar.

It is interesting to note that the responses to the questions in Table 32 show a diversion from what has been found in the other five seminars in that the personal preference for research is more applied than the preferred concern for the participants' organizations. The preferred orientation of their organizations was, however, more basic than they judged it to be at present.

Table 33 indicates a slight shift toward popular publications for reporting research. There was little change in the type of problem they would prefer to work upon, and again the chance to serve people was of great importance both in pretest and posttest.

Table 32. Means and Frequency Distribution of Responses to Lazarsfeld's Form of Applied vs. Basic Research Orientation

- Illinois Seminar -

A. Where would you locate the orientation or prime concern of the organization with which you are presently working?

		Response Frequency						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	Illinois	All Seminars
Pretest		2	9	5	2	0		2.4	2.16
Posttest		2	12	2	2	0		2.1	2.15

B. Where on the same continuum would you prefer the orientation of your organization to be located?

		Response Frequency						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	Illinois	All Seminars
Pretest		1	6	5	6	0		2.9	2.66
Posttest		2	8	4	4	0		2.6	2.40

C. Where on this continuum would you like to do research?

		Response Frequency						Mean	
	Applied	(1)	(2)	(3)	(4)	(5)	Basic	Illinois	All Seminars
Pretest		4	4	7	2	1		2.6	2.54
Posttest		4	7	3	4	0		2.4	2.61

Table 33. Means and Frequency Distribution of Responses to Storer's Scale of Basic vs. Applied Research Orientation

- Illinois Seminar -

A. If you had to choose between reporting your research in a popular publication where laymen would see it and perhaps use your findings, or reporting it in a scientific journal, which would you prefer?

			Means			
	Distribution		Illinois		All Seminars	
Response	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Definitely popular publication	2	3	3.3	2.9	2.96	2.95
Somewhat popular publication	5	6				
I can't make up my mind	1	1				
Somewhat scientific journal	5	5				
Definitely scientific journal	5	3				

B. If it ever came to a choice between working on the practical problems of vocational education (problems important to the local school), or contributing to the development of a body of scientific knowledge, which would you prefer to do?

			Means			
	Distribution		Illinois		All Seminars	
Response	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Definitely practical problems	8	6	2.6	2.7	2.74	2.51
Somewhat practical problems	3	5				
I can't make up my mind	1	1				
Somewhat scientific knowledge	3	3				
Definitely scientific knowledge	4	4				

C. How important to you in a job is the chance to serve people, i.e., to help solve their problems?

			Means			
	Distribution		Illinois		All Seminars	
Response	Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
Of utmost importance	8	7	1.7	1.6	1.60	1.55
Very important	8	9				
Somewhat important	3	2				
Not very important	0	1				
Unimportant	0	0				

CONCLUSIONS AND IMPLICATIONS

The analysis of evaluation data and general observations of the project are the basis to support the conclusions and implications which follow. The first part of this section relates to the evaluation of the seminars. The second part deals with general observations.

Evaluation

The evaluation of the seminars gives general indication of successful accomplishment of the purposes set forth for the seminars. Each type of evaluation exhibited many similarities as well as differences in seminars. The following presents conclusions and implications which seem to be indicated by the data obtained from the evaluation instruments.

Knowledge. In general it may be concluded that there was some gain in knowledge as indicated by a multiple choice test. Only in the North Carolina and Cornell seminars were there much larger numbers of persons showing increases between pretest and all item posttest scores. The Georgia and Illinois seminars showed a slight difference in favor of those increasing, whereas the Colorado seminar was lacking greatly in increments. There was, of course, a different result when only the ten items given to each participant on the pretest were used for posttest scores. Here, there were greater numbers of persons increasing their scores for all seminars but the one at Colorado.

There are several factors which may have contributed to the generally disappointing results in the area of change in knowledge. The first is the difficulty of constructing a reliable and valid test from some of the papers to be delivered at the seminars. Not only was it impossible to obtain a paper beforehand from a few of the consultants, but those that were obtained were not available far enough in advance to allow adequate time for optimum test construction. This leads to two limitations: (1) not all topics of the seminar were included in the test and (2) the actual emphasis given to parts of a topic by the consultant could not be identified from the paper itself. These limitations were especially true of the Ohio, North Carolina and Illinois seminars.

Another possible source of limitation may have been the attitude of the participants toward being tested on the material presented in the seminar. Most participants, since they were professionals, had been removed from the taking of tests for several years and may have been less favorably disposed to try hard at such an endeavor.

A third possibility would be that there had been little change in knowledge, in the positive direction, during the week of the seminars. From subjective observations, and from comments by the participants, this does not seem to be the case. Furthermore, the responses to relevant statements on the Satisfactions evaluation form also indicate that this was not true of the seminars.

These factors indicate to the investigators that either the change in knowledge aspect of evaluation be discontinued for future seminars or else reliable and valid tests be constructed based upon all topics to be presented and emphasizing those parts deemed important by the consultants. The difficulty of attaining this last alternative suggests that the first (no evaluation of change in knowledge) be accepted.

Satisfactions. The data provided by this form of evaluation indicate general satisfaction although certain statements did point out specific differences between seminars.

The statement that "Seminars of this nature should be offered again in future years" was responded to with the greatest degree of agreement - a median response of 4.2 for all seminar participants. The statements "I didn't learn anything new," and "Seminars such as this will contribute little to vo-ed research" were disagreed with heartily (median of 0.8).

This aspect of the evaluation procedures lends great support to the conclusion that the seminars met the purpose set forth. It also indicates some directions for change in the methods of presenting future seminars.

Attitudes. The greatest change in magnitude of responses from pretest to posttest means was .61 on a 7 point scale. There were, however, different patterns in the direction of change between seminars. Though no hypotheses were stated the direction and magnitude of attitudinal change seemed directly related to the content and methods of presentation in the various seminars.

As mentioned above these changes might partially be attributed to regression toward the mean for two of the five seminars. However, the other three seminars (which were given both pretests and posttests) show patterns which do not lead to suspicion of such a statistical artifact. The pretest scores indicated that the participants brought to the seminar positive attitudes toward research. This increased the difficulty of creating change in a positive direction.

It is the judgment of the investigators that any greater shifts in attitude toward research will require more than 5 days' time or else a more directive type of activity. Also, the identification of attitudinal change is a function of the validity of the attitude measurement device used. In the judgement of the investigators further effort should be expended both in the construction of better measuring devices and in the attempt of identifying ways and means of changing attitudes.

Applied vs. Basic Research Orientation. Two conclusions regarding orientation toward basic and applied research seem justified by the data obtained. The first is that little change was noted between pretest and postttest administration of either of the two scales. This orientation reflects a complex value system on the part of individuals and changes of any great extent are not expected in such a short period of time.

The second conclusion indicated by these data is the very applied orientation of participants. On the posttest of the Lazarsfeld instrument the applied end of the continuum was checked for the first three questions by 99, 78 and 82 participants respectively. Opposed to this only 13, 12 and 27 check the basic end of the continuum for questions 1 through 3, respectively.

The Storers instrument on posttest gave a somewhat different picture in that 90 persons preferred to work on practical problems as opposed to 49 who indicated preference for contributing to a body of scientific knowledge. This ratio of almost 2 to 1 was not observed in question 1 which asked in what type of publication they would prefer to publish their research reports. The distribution here was roughly even with 73 prefering popular publications and 67 scientific journals. As could be expected, great importance was given to the chance to serve people as indicated by question 3 where 131 persons checking the utmost or very important categories with only 15 responding in the remaining 3 categories.

A question is raised here by the investigators, as to how we may best serve people. In vocational education, will we best serve people by continuance of this strong orientation toward applied research? It seems that a strong case could be made to support a more basic approach which in the long run may provide greater service to more people. This question is worthy of further consideration and study.

Application of outcome of the seminars. From a list of ten ways participants might use the outcome of the seminars, they were asked to check the two most important. Their responses are given in rank order for the seminars in Table 34. The objectives of the seminars, the interest and orientation of the individuals influenced the rankings--as may be seen in the variations from one seminar to another. The administration of research programs ranked first for the Ohio seminar and sixth for all seminars. Somewhat interesting to note is that the increased ability to advise others in research planning rank first for all seminars. The preparation of research proposals and use in present research projects ranked second and third for the six seminars. The preparation of curriculum materials ranked third for the Georgia and Illinois seminars, but was eighth for the overall rank. The improvement of teaching or supervision ranked fifth for all seminars. This was higher than might be anticipated from seminars on research in vocational education. It may be stated, with the few exceptions pointed out above, that the rankings of the participants' plans to apply results of the seminar are in line with the objectives and content of each seminar.

Table 34. Ranking of the Ways Participants Plan to Apply Outcome of Seminars

Type of Application	Average Rank	Seminar Ranking					
		Ohio	Georgia	Colorado	N.Carolina	Cornell	Illinois
Increased ability to advise others in research planning	1	2	1	1.5*	4	2	3*
Preparation of a research project	2	3.5*	2	1.5*	3	1	7
Use in present research projects	3	6	5*	3	1	4	1
Increased knowledge of research in general	4	3.5*	5*	5.5*	7*	3	5.5*
Improvement of teaching or supervision	5	5	5*	4	5	5.5*	5.5*
Administration of research programs	6	1	7.5*	5.5*	7*	5.5*	8
Planning of vocational training programs	7	7.5*	7.5*	7	2	7	3*
Preparation of Curriculum materials	8	9.5*	3	9.5*	7*	9*	3*
Planning of vocational education facilities	9	7.5*	9.5*	9.5*	9	9*	9.5*
Writing an article or other publication on this topic	10	9.5*	9.5*	8	10	9*	9.5*

* Indicates tie rankings.

General Observations

In the opinion of the investigators the vocational education research seminars should be continued. The development of seminar programs around problem areas has been feasible and it should be continued. Vocational educators request that seminars be planned on topic or problem areas as well as research methodology and statistics. Thus, providing a choice to meet the needs of the individuals.

In the planning and development of a research seminar program, the host university planning committee served a very useful and worthwhile purpose. A committee should continue to advise and assist the seminar director. The overall project director should take an active role in advising and assisting the seminar director in structuring and organizing the program. A variety of methods and techniques should be structured into the program to the end that each member of the group becomes actively involved in a variety of learning activities.

The method used in the selection of participants worked reasonably well. The responsibility should be coordinated by one person. The following would improve and make for a more effective procedure. An announcement giving the content of the seminars should be developed so that applicants would know the specific content in each. Selection criteria should be developed and approved by a selection committee. The announcements, application form and selection criteria should be given wide distribution to all personnel in the various branches of vocational education.

The selection of participants is becoming increasingly important. While the seminars do generate some interest in research there were a number of vocational educators who had not been involved in research projects nor were they engaged in a project at the time. Adequate data on an application form could go a long way in making a decision to accept or reject applicants. The reasons for attending a seminar along with other data would give a basis for selecting participants. A homogeneous group with similar research abilities and interest makes for an effective working group. The success of a seminar is dependent upon the above as much as or more than any other factor.

In planning of a program that includes consultants from various disciplines, it is most important to orient the consultant to the application and use of the presentation. Then, the consultant or seminar director should follow up with the group so that they relate and make application of the content to research. More than a lecture is required to develop abilities and attitudes needed in research. Two seminars in which the lecture method prevailed were considered to be less satisfactory by the participants than those in which a variety of methods, techniques and procedures were used to involve the participants. A week of mostly lectures is to be avoided.

In view of the statements above it must be said that the consultants in the academic disciplines, education and vocational education, with a few exceptions gave excellent presentations. A mix when appropriate from all three can make a desirable contribution. Each has a place and can make a contribution.

Two host university seminar directors did an exceedingly fine job in obtaining copies of the major presentations from the consultants and duplicating copies for the participants prior to the seminar. In one seminar the papers were distributed at the beginning of the seminar. In the other, papers were passed out after the speakers gave their presentation. The majority of the participants in one seminar, where speeches were given out in advance of the presentation, preferred this to distribution afterwards.

Summary of Project OE-6-85-027

Title: The Further Development of Research Competencies of Personnel in Vocational Education Research and Development

Investigator: C. W. Hill, Professor, Agricultural Education

Institution: Cornell University
Ithaca, New York

Duration: September 1, 1965 to August 31, 1966

Purpose:

The major objective of this project was to develop further the research knowledge, competencies and interests of individuals engaged in, or soon to become engaged in, research in the field of vocational education. Six problem-centered areas were identified for a one-week research seminar in each of six universities.

Procedure:

The Research Committee of the American Vocational Association, in cooperation with vocational education staff in the U.S. Office of Education and selected universities initiated and conducted a series of vocational education research seminars beginning in 1963. The first was conducted on research design at Purdue in 1963. The following year two were held, one at University of Illinois and the other at Pennsylvania State University. In 1965 the U.S. Office of Education approved a project submitted by the University of Illinois and financed under P.L. 88-210 Section 4(c) for four research seminars.

The Research Committee of AVA asked Cornell University to develop a proposal and seek approval of a project for coordinating and funding the vocational education research seminars in 1966.

In a meeting with representatives of the U.S. Office of Education, AVA Research Committee, and selected universities, it was decided to conduct six seminars and to concentrate upon six problem areas.

The appropriate administrative staff in the universities were contacted to: (1) select and designate a seminar director, (2) select the date for the seminar, (3) decide on the number of participants that could be accommodated, and (4) decide upon the objectives and content for the seminar. The seminar directors, with the advice and assistance of a planning committee, worked out the plans for a five-day seminar in each of the universities.

An announcement of the seminars was placed in the September 1965 issue of the American Vocational Jouranl. Readers were informed that further information and an application form could be obtained from the Project Director. An announcement of the seminars and application forms were sent to state directors of vocational education, state directors of Research Coordinating Units, former participants in vocational education research seminars and vocational administrators in universities.

A selection committee, composed of the AVA Research Committee and U.S. Office of Education staff, reviewed data submitted on application forms and selected participants for each of the seminars. The lists of participants were sent to each of the seminar directors in the host universities, and they extended the invitations to attend.

In the development of the programs, the seminar directors, with some assistance of a planning or advisory committee, sought and obtained the services of consultants, nationally known and recognized, who could make an outstanding and significant contribution to the seminar program. The consultants came from such academic disciplines as sociology, psychology, economics, research, statistics, philosophy, education, and from other areas such as governmental services at state and national levels, vocational education and public schools. Many of the consultants prepared in advance a copy of their presentation, so that the seminar directors were able to duplicate and distribute copies to participants at the seminar.

The evaluation of the seminars was a part of the approved project. Areas selected for evaluation were participants' satisfaction with the seminars, changes in knowledge, research attitude, and basic vs. applied research orientation. Instruments were adapted or developed to assess changes in each of the areas. A Likert-type instrument was used for measuring participant satisfactions. Multiple-choice questions were developed to ascertain change in knowledge of subject matter. A semantic differential was developed to assess changes in attitudes toward thirty research terms. Two types of scales were used to assess basic vs. applied research orientation. A pretest was given at the beginning of the seminars and a posttest at the end.

Results:

A series of six one-week vocational education research seminars were planned and conducted as listed below.

Seminar	Date	Host University and Seminar Director	Number of Participants
Development and Coordination of Research by State Research Coordinating Units	January 30-February 4, 1966	Ohio State University Robert Taylor	56
Curriculum Development	February 7-11, 1966	University of Georgia Herschel Lester, Jr.	41
Tests and Measurement	March 27-April 1, 1966	Colorado State University Douglas Sjogren	44
Occupational Mobility and Migration	April 17-22, 1966	North Carolina State University Harry Beard	34
Research Design	May 1-6, 1966	Cornell University Frederick K.T. Tom	44
Curriculum Evaluation	May 16-20, 1966	University of Illinois William Schill	39

In addition to 244 participants from the states, 14 staff from the U.S. Office of Education also attended, making a total of 258 participants for all of the seminars.

These seminars were conducted primarily to further the development of the research competencies in vocational educators. The analysis of evaluation data and observations by project staff support the conclusions and implications which follow.

The evaluation of the seminars gives general indication that the objectives were successfully achieved for the seminars. Each type of evaluation exhibited many similarities as well as differences among the seminars.

In the North Carolina and Cornell seminars there were larger numbers of persons showing increases in scores between pretest and on all posttest items. The Georgia and Illinois seminars showed a slight gain, whereas, the Colorado seminar was lacking in increments. There was a different result when only the ten items given to each participant on the pretest were used for the posttest scores. Here, there were greater numbers of persons increasing their score for all seminars except the one at Colorado. The construction of valid tests, the emphasis placed upon topics by the consultants and the sophistication of the individuals were factors influencing the results in achievement.

The data on participant satisfactions with the seminars lend great support to the conclusion that the seminars met the purpose set forth. The support of this varied from seminar to seminar and the degree of agreement between items. Overall, the purposes, content, methods, techniques and procedures were acceptable. However, the findings indicate that a sizable number of participants in two seminars were not well satisfied with the objectives or the lack of objectives and the structure and functions in the operation of the seminars.

The data on changes in research attitude derived from the semantic differential resulted in different patterns in the directions of change between seminars. In one seminar the direction of change was positive. In others the change in attitude was positive and negative; while in one seminar the pretest mean was very high indicating that the participants brought to the seminar a high positive attitude toward research. Then on the posttest the mean for the group declined. This might be attributed to regression toward the mean, characteristic of test-retest results on the semantic differential. The pretest scores indicated that the participants brought to the seminars a positive attitude toward research. This increased the difficulty of creating change in a positive direction. It should be recognized that to make any significant changes in attitudes, more than five days are required.

The data on the orientation of participants toward basic and applied research indicated very little change between pretest and posttest administration of the two scales. This orientation reflects a complex value system on the part of individuals and changes of any great extent are not expected in such a short period.

As indicated by a Lazarsfeld type of instrument the participants were highly oriented to the applied research end of the continuum in contrast to basic research. An approximate ratio of two to one preferred to work with practical problems as opposed to contributing to scientific knowledge.

The findings in the evaluation of the seminars and observations strongly support the continuation of research seminars for vocational educators. Seminar programs should be based upon topics or problem areas in vocational education as well as research methodology and statistics. Thus, providing a choice to meet the needs of individuals.

The selection of participants is becoming an increasingly important problem. Individuals involved or likely to be involved in research should be invited to seminars. A homogeneous group with similar research abilities and interests makes for an effective seminar.

References

1. Lazarsfeld, P. F. and Sieber, S. D. *Organizing Educational Research*. Englewood Cliffs, N. J. Prentice Hall, Inc. 1964.

2. Storers, Norman W. "Science and Scientist in an Agricultural Research Organization: A Sociological Study." (Ph.D. Thesis, Cornell University, 1961) 231 pp.

3. Weldon, J. Eugene. "Conference Evaluation." Letter from J. Eugene Weldon to Douglas Towne, January 14, 1966, granting permission to use instrument.

Appendix

A. Program and List of Participants for Seminars Held at:

Ohio State University

University of Georgia

Colorado State University

North Carolina State University

Cornell University

University of Illinois

National Vocational Education Research Seminar
on
DEVELOPMENT AND COORDINATION OF RESEARCH
BY STATE RESEARCH COORDINATING UNITS
Ohio State University
January 31-February 4, 1966
Robert E. Taylor, Seminar Director

PROGRAM

Purpose of the Seminar

To assist research coordinating unit personnel and other educational leaders in fulfilling their roles in planning and conducting comprehensive state programs of research and development in vocational education.

Objectives

1. To develop a concept of research and development for state programs of vocational education and the conditions essential to its implementation and success.

2. To develop an understanding of a functional organizational structure for establishing and administering a program of research and development in vocational education.

3. To identify key individual and organizational roles and clarify their relationships to research and development activities.

4. To develop an understanding of the dynamics of planned change through research and its application to vocational education.

5. To stimulate empathy and support for research and development activities in vocational education.

6. To establish lines of communication for coordinating state, regional and national research and development activities in vocational education.

7. To provide a setting where individuals can share ideas and seek solutions to common operational problems in vocational education research and development activities.

Monday, January 31

Chairman: V. E. Christensen, Consultant, The Center for Vocational and Technical Education, The Ohio State University

8:30	Registration	
9:15	Introduction of participants	
9:30	Welcome to The Ohio State University	Alfred B. Garrett Vice President for Research The Ohio State University
9:45	Overview of the Seminar	Robert E. Taylor, Director The Center for Vocational and Technical Education The Ohio State University
10:30	The Research and Development Concept - What Is There to be Done and Who Can Do It Best?	Ray Jongeward Director of Research Office of Superintendent of Public Instruction Olympia, Washington
11:15	Reactors	John Bean U.S. Office of Education
		Byrl Shoemaker Director, Vocational Education State of Ohio
11:40	Discussion period	
1:30	Implications of Diffusion Research to Implemented Change in Education	H. F. Lionberger, Chairman Department of Rural Sociology University of Missouri
2:15	Discussants:	Alan Robertson, Chief Bureau of Research and Evaluation State Education Department New York
3:15	Questions and Reactions by Participants to Presentations	H. F. Lionberger

Tuesday, February 1

8:30	Improving Research in Vocational Education	Alan Knox, Professor of Education Teachers College Columbia University, New York City
	Reactor	David L. Clark Professor of Education The Ohio State University
10:15	Structuring the Situation for Research	Loyal Joos Director of Systematic Studies Oakland Schools Pontiac, Michigan

10:15 con't.-	Reactor	Gordon Swanson Professor and Coordinator International Programs College of Education University of Minnesota
1:30	Discussion period with panel	Alan Knox Loyal Joos Gordon I. Swanson David L. Clark
3:15	Small group discussion - Establishing Role and Policy for Research Coordinating Units	Discussion Leaders: Ray Jongeward, Washington Alan Robertson, New York Robert Worthington, New Jersey
6:30	Banquet	Toastmaster: William B. Logan Director of Distributive Education The Ohio State University
	Introduction of Guests	
	Entertainment	
	Address	John Furbay, Guest Lecturer Courtesy of General Motors Detroit, Michigan

Wednesday, February 2

Chairman: Ralph E. Bender, Chairman Department of Agricultural Education, The Ohio State University

8:30	Panel - Major issues in the operation and management of research coordinating units	
	Getting Established	Howard Nelson University of Minnesota
	Structure and Organization	Ken Shibita University of Nebraska
	Staff and Staffing	Carl Lamar University of Kentucky
	Relationships	Douglas Sjogren Colorado State University
	Daily Operation	Trevor Howe Iowa State Department of Education
	Moderator	James Wall Mississippi State Department of Education
10:15	Round table discussion groups	
11:00	Discussion period - Panel forum	

1:30	What Constitutes a Researchable Problem and a Respectable Proposal	Egon Guba Professor of Education The Ohio State University
2:30	Discussion period	Egon Guba
3:15	Round table discussion on the problems and issues arising in the Research Coordination Units and State Vocational research offices as to establishing research priorities and designing proposals	
4:00	Discussion period	Egon Guba
7:00	Evening Session - in University School	
	Putting Data Processing to Work in Vocational Education	Loyal Joos

Thursday, February 3

Chairman: Willis E. Ray, Professor of Education
Industrial Arts Education, The Ohio State University

8:30	Putting PERT to Work in Research Units	Desmond Cook, Professor of Education The Ohio State University
10:15	Workshop Sessions	Leaders: Desmond Cook, Ohio Michael Munger, Nebraska John Coster, Nebraska
11:00	Discussion period with workshop sessions leaders	
1:30	Questions period	
1:45	Involvement of State Research and Development Units in Regional and National Projects	
	(1) Reports on Current Research and Development Activities	
	Panel	Boyd Applegarth, California Dick Rice, Ohio Harry G. Beard, North Carolina
	(2) The National Program Evaluation as called for in the Vocational Education Act of 1963	Bernard Michael Program Evaluation Officer Division of Vocational-Technical Education U.S. Office of Education
3:15	Small group simulation sessions	Leaders: Boyd Applegarth Dick Rice Harry G. Beard Bernard Michael

4:00	Small groups report back to session Discussion period with panel members	

Friday, February 4

Chairman: Robert M. Reese, Professor of Education,
Trade and Industrial Education, The Ohio State University

8:30	Question period	
8:45	Dissemination of Research and Development Information	Harold Haswell, Director Educational Reserve Information Center (ERIC) U.S. Office of Education
10:30	Post-Seminar evaluation	
11:15	What Lies Ahead	David Bushenll, Director Division of Adult and Vocational Research U.S. Office of Education
12:00	Announcements and close	

Seminar Planning Committee

Robert E. Taylor	Seminar Director and Director, The Center for Research and Leadership Development in Vocational and Technical Education, The Ohio State University
Ralph E. Bender	Chairman, Department of Agricultural Education The Ohio State University
V. E. Christensen	Consultant, Research Design The Ohio State University
Marie M. Dirks	Professor, Home Economics Education The Ohio State University
William B. Logan	Director of Distributive Education and Professor of Education The Ohio State University
Robert M. Reese	Director, Trade and Industrial Arts Education The Ohio State University
Edward R. Towers	Associate Professor, Industrial Arts Education The Ohio State University
Inez R. Wells	Professor, Business Education The Ohio State University

Participants

James C. Atherton
Joseph K. Bailey
Phillip Baird
Edward T. Brown
Clarence E. Bundy
V. E. Burgener
Fairchild Carter
B. E. Childers
Evan Confrey
John Cummings
Edward F. Davey
Richard A. Dowd
Kenneth M. Eaddy
Everett D. Edington
Frederic Finsterbach
Don Frazier
Melvin H. Garner
Wayne Grames
Peter T. Harkness
Chester A. Hausken
Rufus W. Hogard
Trevor G. Howe
Edward B. Hudgens
Norman F. Hyatt
Minnard H. Jones
Ronald E. Kaiser
Charles L. Langdon
Carl F. Lamar
Arthur M. Lee
Kenneth M. Loudermilk

Austin G. Loveless
William McNiece
Philip Masley
George McCutchan
Fred Miner
Myra Mosier
Elwyn H. Nagel
Howard E. Nelson
Merrill Redemer
Fernando Roca de Leon
John Rolloff
T. A. Ryan
Gene Schrader
Dora R. Sheldon
A. G. Sheperd, Jr.
Kenneth E. Shibata
Douglas Sjogren
Bill Stevenson
Alvin I. Thomas
Cecil O. Towers
George A. Wagner
James E. Wall
R. W. Whinfield
Robert G. Whittemore, Jr.
Kenneth M. Wold

John E. Bean

National Vocational Education Research Seminar
on
CURRICULUM DEVELOPMENT
University of Georgia
February 7-11, 1966
Herschel Lester, Seminar Director

PROGRAM

Specific Objectives

1. To ascertain specific variables which should be controlled in designing vocational-technical education curriculum studies.
2. To outline and criticize curriculum development studies which have employed various research methods.
3. To establish need for participants to engage in curriculum research that would serve as a catalytic agent for designing of future studies.
4. To review tentative curriculum-development proposals.

Monday, February 7

8:00	Registration	
8:30	Introduction and Plans for the Seminar	
9:00	Curriculum Studies - A Challenge an Opportunity	Duane Nielsen Educational Resources Development Branch U.S. Office of Education
10:30	AVA Research Committee and Seminar Evaluation	Charles W. Hill, Project Director Cornell University
	Presiding: Bill Cheshire, University of Georgia Head, Distributive Education	
1:30	Labor Market Analysis and Projections	Robert E. Maritold Office of Manpower, Automation and Training U.S. Department of Labor
3:15	The Interpretation of Economic Data	Norman J. Wood Professor and Head Department of Economics University of Georgia
7:00	Evening Activities Reception	

Tuesday, February 8

Presiding: Aleene Cross, Head, Home Economics Education,
University of Georgia

8:30	Social Stratification	Raymond Payne Professor of Sociology University of Georgia
10:15	Relationships of Community Environment to the Vocational Education Curriculum	Selz C. Mayo, Director Center for Research, Development and Training in Occupational Education North Carolina State University
1:30	Educational Psychology and the Curriculum	Joe Bledsoe Professor of Education University of Georgia
3:15	Current Research Developments in the U.S. Office of Education	Duane Nielsen
	Questions	
7:00	Departmental Activities	

Wednesday, February 9

Presiding: G. L. O'Kelley, Jr., Professor of Agricultural Education
University of Georgia

8:30	Statistical Models in Curriculum Development Studies	Harry E. Anderson, Associate Director, Center for Educational Stimulation University of Georgia
10:15	The New Mathematics: A Pattern for Curriculum Reform	Joseph R. Hooten, Jr. Professor of Mathematics Education University of Georgia
1:30	Curriculum Development and Evaluation in English	Mary J. Tingle Associate Professor of Education University of Georgia
3:00	The Anthropology Curriculum Project as a Model for Curriculum Development: Practical Problems	Marion Rice Assistant Professor of Education University of Georgia
7:00	Banquet	
	Introductions	
	Institutional Research Programs	J. A. Williams, Dean College of Education University of Georgia

Thursday, February 10

Presiding: C. C. Calhoun, Head, Business Education
University of Georgia

8:30 Panel - Review of Current Curriculum Studies

1. Development and Evaluation of an Experimental Curriculum for the New Quincy, Massachusetts Vocational-Technical School - Edward J. Morrison, Director of Vocational Research, American Institutes of Research
2. An Experimental Evaluation of Approaches to Preparing High School Students for Agriculture Occupations Other than Farming - John Coster, Director, Agricultural Education Research, University of Nebraska
3. Occupational Requirements in Office Occupations for School Leavers - Fred Cook, Chairman, Business Education, Wayne State University
4. Evaluation of Secondary School Programs to Prepare Students for Wage Earning in Occupations Related to Home Economics - Helen Y. Nelson, Associate Professor, Home Economics Education, Cornell University

1:30 General Proposal Writings - Warren Findley, Director, Center for Educational Stimulation, University of Georgia

3:15 Panel - Formal Review of Prepared Curriculum Proposals

James B. Kenney, Assistant Professor of Education, University of Georgia

Kathryn Blake, Associate Director, Center for Educational Stimulation, University of Georgia

Karl King, Assistant Professor of Family Development, University of Georgia

Charles Johnson, Associate Director, Center for Educational Stimulation, University of Georgia

Leonard Pikaart, Assistant Professor of Mathematics Education, University of Georgia

Friday, February 11

Presiding: Karl Doss, Head, Trade and Industrial Education,
University of Georgia

8:30 Panel - Formal Review of Participants' Curriculum Proposals

11:30 Seminar Evaluation

12:00 Luncheon

Completion of Seminar - H. T. Lester, Jr., Vocational Research, Seminar Director

General Planning Committee

C. C. Calhoun
Donald L. Crawford
Ralph H. Tolbert
George L. O'Kelley
Karl Doss
A. B. Racster
Aleene Cross
Fannie L. Boyd
H. T. Lester, Jr., Chairman, Seminar Director

Program and Arrangements Committee

Aleene Cross
H. T. Lester, Jr.
George L. O'Kelley, Jr.

Participants

Hazel Anthony
Joseph Arnold
R. A. Baker
Carl R. Bartel
Julia M. Boleratz
June Cozine
Lucy C. Crawford
Gordon F. Culver
Jerry S. Dobrovolny
Alfred S. Drew
Jack S. Duncan
George Ekstrom
Kenneth A. Ertel
Edward T. Ferguson, Jr.
George Fuka
Anna M. Gorman
Gilbert S. Guiler
Wayne House
Maude A. Hudson
Thomas A. Jackson
Mary K. Klaurens
Eleanore L. Kohlmann
Frank J. Konecny
Roland J. Krogstad
William B. Logan
Gene M. Love
Joseph F. Luetkemeyer
Donald G. Lux
Alan W. Metcalf
John L. O'Brian
David Joseph Pucel
Henry James Rokusek
Harland E. Samson
Jacob Stern
Jerry Streichler
Philip R. Teske
Frederick K. T. Tom
Gail Trapnell
J. R. Warmbrod
Earl S. Webb

Sidney C. High

National Vocational Education Research Seminar
on
TESTS AND MEASUREMENTS
Colorado State University
March 28-April 1, 1966
Douglas Sjogren, Seminar Director

PROGRAM

Sunday, March 27

7:30	Reception	Mrs. Juanita Roberts, Hostess

Monday, March 28

8:00	Registration	
8:30	Orientation	Douglas Sjogren Charles W. Hill
10:00	Presiding	Herbert Benson
	Tests and Measurements in Research	J. Stanley Ahmann
1:30	Workshop Session Number One	Charles O. Neidt C. Dean Miller
	Workshop Assistants:	David Sheppard Charles Stewart James Sheard Bradley Huitema
7:30	All evenings except Wednesday are available for small group discussions and work on the seminar project.	

Tuesday, March 29

8:30	Presiding	Randall Nelson
	Test Validity in Predictive Research	Garlie Forehand
10:30	Discussion of Dr. Forehand's Paper	
1:30	Presiding	John Flanagan
	Available Tests and Their Use in Research in Vocational Education	Margaret Crawford
3:30	Opportunity for individuals to consult with Dr. Forehand, Dr. Crawford, or work on the seminar project.	

Wednesday, March 30

8:30	Presiding	Irving Cross
	Test Validity in Experimental and Curriculum Research	Robert Stake
	Discussion of Dr. Stake's Paper	
3:00	Tour of National Bureau of Standards, Boulder, Colorado	
6:30	Banquet	Jim Wilson, Presiding
	Program	Robert Brown

Thursday, March 31

8:30	Presiding	Ralph Canada
	Validity in Survey Research	Alan Knox
10:30	Discussion of Dr. Knox's Paper	

Friday, April 1

8:30	Presiding	Joe Roberts
	Evaluation Activity	Charles W. Hill Douglas Sjogren
9:00	Decisions in selecting and developing instruments for a research project	John Coster Tom Lyons
10:30	Summary of Workshop	Charles O. Neidt C. Dean Miller
11:30	Adjournment	

Personnel Appearing on Program

J. Stanley Ahmann, Academic Vice President, Colorado State University

Juanita Roberts, Instructor, Vocational Education, Colorado State University

Herbert Benson, Professor and Head, Vocational Education, Colorado State University

Charles O. Neidt, Professor and Head, Department of Psychology, Colorado State University

Charles W. Hill, Professor of Agricultural Education, Cornell University and Seminar Project Director

C. Dean Miller, Assistant Professor, Department of Psychology, Colorado State University

Garlie Forehand, Professor and Acting Head, Department of Psychology, Carnegie Institute of Technology

Randall Nelson, Assistant Professor, Department of Education, Colorado State University

John Flanagan, Assistant Professor, Department of Education, Colorado State University

Margaret Crawford, Assistant Dean of Counseling and Guidance, Los Angeles Trade Technical College

Irving Cross, Assistant Professor, Vocational Education, Colorado State University

Robert E. Stake, Associate Professor, Center for Instructional Research and Curriculum Evaluation, University of Illinois

Jim Wilson, Assistant Professor, Vocational Education, Colorado State University

Robert Brown, Denver Public Schools

Ralph Canada, Professor, Vocational Education, Colorado State University

Alan Knox, Professor, Department of Education, Teachers College, Columbia University

Joe Roberts, Instructor, Vocational Education, Colorado State University

John Coster, Professor, Agricultural Education, University of Nebraska

Tom Lyons, Project Director, Agricultural Education, University of Nebraska

Douglas Sjogren, Associate Professor, Vocational Education, Colorado State University and Seminar Director

David Sheppard, Research Associate, Vocational Education, Colorado State University

Charles Stewart, Graduate Assistant, Colorado State University

James Sheard, Graduate Assistant, Colorado State University

Bradley Huitema, Graduate Assistant, Colorado State University

Program and Planning Committee

Douglas Sjogren, Chairman and Seminar Director

Charles O. Neidt
Ralph Canada
Joe Roberts

C. Dean Miller
John Flanagan
Juanita Roberts

Participants

Gladys E. Abad
Richard D. Ashmun
Robert F. Barnes
David Bjorquist
James Eugene Bottoms
James E. Bowman
V. R. Cardozier
Hester Chadderdon
Virgil E. Christensen
John K. Coster
Harold R. Cushman
Lawrence W. Drabick
John H. ERickson
B. B. Griffith
J. Marshall Hanna
Hildegarde Johnson
Denis Kigin
Ronald L. Koble
Herschel T. Lester, Jr.
Nell P. Logan
Gordon G. McMahon
Wilbur R. Miller
William E. Mortimer
Robert Mullen
Orville W. Nelson
A. Laverne Phillips
Lloyd J. Phipps
Alan G. Robertson
Charles H. Rogers
William John Schill
William P. Spence
George Storm
Alan R. Suess
H. Paul Sweany
Erroll John Terrell
O. E. Thompson
Bruce W. Tuckman
Neal E. Vivian
Richard H. Wilson
Fred Winger
Lawrence S. Wright

Otto P. Legg
Richard Otte
Robert Knoebel

National Vocational Education Research Seminar
on
OCCUPATIONAL MOBILITY AND MIGRATION

North Carolina State University

April 18-22, 1966

Harry Beard, Seminar Director

PROGRAM

Objectives

1. To secure a better understanding of the problems and decisions facing educational policymakers, program planners, administrators and teachers.
2. To develop a conceptual framework for studying socio-economic mobility.
3. To develop an understanding of the status of research in labor supply, labor demand, migration, and socio-economic mobility.
4. To become acquainted with appropriate research rationales, designs and methodologies.
5. To identify problem areas for research.
6. To identify specific researchable problems.
7. To acquire an understanding of the resources available, particularly at the state level, to conduct research in occupational mobility and migration.
8. To begin to develop lines of communication to exploit available resources to conduct research and to disseminate research findings.

Sunday Evening, April 17

6:00-9:00 Registration

Monday, April 18

Chairman: H. G. Beard, Associate Professor, Education and Rural Sociology, North Carolina State University

9:00	Greetings	Selz C. Mayo, Head, Sociology and Anthropology and Rural Sociology North Carolina State University

9:15	Introduction of Participants	
9:30	Overview of the Seminar	
9:45	Pre-seminar Evaluation	C. W. Hill Project Director of Research Seminars Cornell University
10:30	The Need for Research and Its Utilization in Local, Regional and State Systems of Education	Dean Rupert N. Evans College of Education University of Illinois
11:30	Reaction	H. M. Hamlin, Visiting Professor School of Education North Carolina State University
11:45	Discussion	
1:45	Setting the Stage for a Study of Occupational Mobility and Migration	E. Walton Jones Associate Professor of Economics North Carolina State University
2:30	Discussion	
3:30-5:00	Organizing Interest Groups (at least four)	

Tuesday, April 19

Chairman: H. M. Hamlin

8:30	Manpower Supply in the United States	Howard Rosen U.S. Office of Manpower Policy Evaluation and Research, U.S. Department of Labor
9:10	Reaction	C. E. Bishop, Head Department of Economics North Carolina State University
9:25	Discussion	
10:30	Manpower Requirements by Industry and Occupation	Sol Swerdloff Bureau of Labor Statistics U.S. Department of Labor
11:10	Reaction	J. G. Maddox, Professor Department of Economics North Carolina State University
11:25	Discussion	
1:30	The Role of Spatial Mobility in Occupational Change	Everett S. Lee, Professor Population Studies Center University of Pennsylvania
2:10-2:25	Reaction	C. Horace Hamilton, Professor Department of Rural Sociology North Carolina State University
2:25-3:00	Discussion	

3:30	The Social-Psychological Dimensions of Occupational Mobility	William P. Kuvlesky, Assistant Professor Department of Agricultural Economics and Sociology Texas A & M University
4:10	Reaction	L. W. Drabick Research Associate Professor Departments of Agricultural Education and Rural Sociology North Carolina State University
4:25	Discussion	
7:00-9:00	Individual Conferences by Appointment with Consultants	

Wednesday, April 20

Chairman: Charles E. Lewis, Administrative Assistant,
Center for Research, Development and Training,
North Carolina State University

8:30	Understanding Social Mobility	Selz C. Mayo, Head, Department of Sociology North Carolina State University
9:00	Reaction	
	Chairman of Interest Groups	
9:30	Discussion	
10:30	Planning Work of Interest Groups	
11:00	Meetings of Interest Groups (consultants available)	
1:30-5:00	Meetings of Interest Groups (consultants available)	
7:00	Banquet	
	Address	H. F. Robinson Administrative Dean for Research North Carolina State University

Thursday, April 21

8:30-12:00	Meetings of Interest Groups (consultants available)
1:30	Report from Interest Group No. 1
2:15	Report from INterest Group No. 2
3:30	Report from Interest Group No. 3
4:15	Report from Interest Group No. 4

Friday, April 22

8:30	Panel: Opportunities Ahead	Representatives of Interest Groups
10:30	Policy Decisions Facing State Boards of Education and the Need for Research	Dallas Herring, Chairman, North Carolina State Board of Education
11:10	Reaction	A. G. Bullard Director of Vocational Education North Carolina Department of Public Instruction
11:25	Post-seminar Evaluation	C. W. Hill, Project Director
12:00	Adjournment	

Seminar Planning Committee

H. M. Hamlin, Visiting Professor, School of Education, North Carolina State University

C. Horace Hamilton, Professor, Department of Rural Sociology, North Carolina State University

E. Walton Jones, Associate Professor, Department of Economics, North Carolina State University, Vice Chairman

Charles E. Lewis, Administrative Assistant, Center for Research, Development and Training in Occupational Education, North Carolina State University

Harry G. Beard, Associate Professor, Departments of Education and Rural Sociology, North Carolina State University, Chairman, Planning Committee

Participants

John M. Adams, Jr.
Arch B. Alexander
Philip G. Baird
H. E. Beam
Irene Beavers
James W. Becket
S. T. Brantner
V. E. Burgener
Calfrey C. Calhoun
Harley R. Cheshire
Angel L. Alicea-Colon
Charlie M. Curtis
Jeanne Dost
John Ephraim
John C. Gilliam
Nathan Gross
Leslie V. Hawkins

Thomas A. Hoerner
William A. Householder
James Kiefert
L. C. McDowell
O. Donald Meaders
Carl A. Moeller
Lloyd A. Ponder
Jane Preston
Al Ringo
William B. Runge
Robert E. Scott
Benjamin Clifford Tinnell
Douglas C. Towne
Mercedes I. Vercher
Ralph J. Woodin

Lawrence Braaten
Emanuel Weinstein

National Vocational Education Research Seminar
on
RESEARCH DESIGN

Cornell University

May 2-6, 1966

Frederick K.T.Tom, Seminar Director

PROGRAM

Over-all Purpose of the Seminar

This seminar was designed to develop in the participants a greater interest in conducting experimental research of increasingly higher quality and quantity in the field of vocational education and to improve their ability to design such research.

Specific Objectives

As a result of attending the seminar, it is hoped that the participants would be able to:

1. Demonstrate an increased interest in conducting experimental research in vocational education.
2. Identify the principles and procedures which should be followed in designing experimental research.
3. Select the proper statistical tools.
4. Determine whether a given sampling procedure is defensible for a given piece of research.
5. Recognize the strengths and weaknesses of selected research proposals.
6. Cite the research functions of the U.S. Office of Education under Public Law 88-210, Section 4(c).

Monday, May 2

8:30	Registration	
9:00	Greetings and Welcome	Nyle C. Brady, Director of Research New York State College of Agriculture Cornell University

9:15	Overview and Plan of Seminar	Frederick K.T.Tom, Seminar Director Associate Professor of Agricultural Education Cornell University
	Development of the National Vocational Education Research Seminars	Charles W. Hill, Project Director Professor of Agricultural Education Cornell University
10:30	Keynote Address - The Role of Experimental Research in Education	Jason Millman, Associate Professor of Educational Psychology and Measurement Cornell University
1:15	Some Perspectives on the Research Process	David R. Krathwohl, Dean, School of Education Syracuse University
3:15	More on the Research Process and Its Implications for Proposal Writing	Dean Krathwohl
4:30	Tour of Campus	

Tuesday, May 3

9:00	The Preparation of Research Proposals and the Design of Experimental Research	Dean Krathwohl
10:30	The Arithmetic of Analysis of Variance	Donald G. MacEachern Assistant Professor of Educational Psychology, College of Education University of Minnesota
11:45	Lunch (Statler)	
1:15	The Preparation of Research Proposals and the Design of Experimental Research	Dean Krathwohl
3:15	Topics in the Analysis of Variance	Professor MacEachern
6:30	Banquet at Statler, Faculty Lounge	
	Greetings	Frederick H. Stutz, Dean, School of Education Cornell University

Wednesday, May 4

9:00	The Analysis of Variance in Research	Professor MacEachern
10:30	Sampling Procedures in Research	Professor MacEachern

1:15	Study of Four Selected Research Proposals in Vocational Education	Small group sessions
3:15	Study of Four Selected . . . (continued)	
4:00	An Analysis of Above Selected Research Proposals	Eunice H. Jones, Project Coordinator, Human Resources Branch, USOE Virginia F. Thomas, Specialist, Educational Resources Development Branch, USOE Jack A. Wilson, Labor Economist Employment Opportunities Branch, USOE Sherrill McMillen, Director, Planning and Program Development Branch, USOE

Thursday, May 5

9:00 Current Experimental Studies in Vocational Education

1. An Experimental Evaluation of Approaches to Preparing High School Students for Agriculture Occupations Other than Farming - John K. Coster, Professor and Director of Research, College of Agriculture and Home Economics, University of Nebraska
2. Maximization of the Professional Potential of Home Economics Teachers through Group Counseling - Elizabeth M. Ray, Associate Professor of Home Economics Education, Pennsylvania State University

10:30 3. The Relative Effectiveness of the Traditional and Two Modified Methods of Organizing Information Sheets - David J. Pucel, Instructor, Department of Industrial Education, University of Minnesota

4. Development of a Curriculum and Materials for Teaching Basic Vocational Talents - John T. Dailey, Research Professor, George Washington University

1:15	Current Research Developments in the U.S. Office of Education	Sidney C. High Specialist in Research
3:15	Latest Developments in Computer Science with Implications for the Educational Researcher	Karl L. Zinn, Research Associate Center for Research on Learning and Teaching University of Michigan

Friday, May 6

9:00	Formal Review of Research Proposals Submitted by Seminar Participants (by role-playing panel)	Sidney High, USOE, Chairman Donald MacEachern, Minnesota Sara Blackwell, Cornell Harold R. Cushman, Cornell D. Bob Gowin, Cornell

10:30	Formal Review (continued)	
11:30	Evaluation of Seminar	Professor Hill

Members of the Seminar Advisory Committee

Frederick H. Stutz	Dean, School of Education
Harold R. Cushman	Professor of Agricultural Education
Felician F. Foltman	Professor of Industrial & Labor Relations
Jason Millman	Associate Professor of Educational Psychology and Measurement
Helen Y. Nelson	Associate Professor of Home Economics Education
Frederick K.T.Tom	Associate Professor of Agricultural Education, Chairman and Seminar Director

Participants

Ray Agan
Zelpha Bates
James Bikkie
Ilene Brown
Charles Bryant
Earl T. Carpenter
Kenneth R. Clay
James Clouse
Wayne E. Courtney
David G. Craig
Jean Cooper
Julia I. Dalrymple
John Egermeier
Roswell E. Fairbank
Everett R. Glazener
Kenneth L. Hansen
R. Edward Harris
Alberta D. Hill
William L. Hull
Denver B. Hutson

Arthur K. Jensen
John W. Karnes
Carmela C. Kingston
Shirley M. Kreutz
Milton E. Larson
Calvin D. Lowe
Roy E. McDermott
Charles W. Nichols
William R. Pasewark
Bernadine H. Peterson
Robert Poland
Dale J. Prediger
Kenneth L. Rowe
Twyla Shear
John F. Stephens
Ruth Stovall
Helen W. Taylor
Robert M. Tomlinson
Darrell S. Willey

Eunice H. Jones
Sherrill McMillen
Withro McEnge
Virginia F. Thomas
Jack A. Wilson

National Vocational Education Research Seminar
on
CURRICULUM EVALUATION
University of Illinois
May 16-20, 1966
William Schill, Seminar Director

PROGRAM

Monday, May 16

8:00	Registration	
9:00 & 11:00	Tour of Socrates Installation -	conducted by Henry Lippert Bureau of Educational Research University of Illinois
12:00	Welcome	Rupert Evans, Dean, College of Education University of Illinois
	Presentations	Charles W. Hill, Project Director
2:00	Chairman	M. Ray Karnes, College of Education University of Illinois
	Problems and Prospects in Vocational Education	Harry Broudy, College of Education University of Illinois
	Responses:	Stephanie Edgerton, College of Education University of Wisconsin James Gallagher, College of Education University of Illinois Jacob Stern, College of Education University of Illinois

Tuesday, May 17

8:30	Chairman	Robert Tinkham University of Illinois
	Sociology and Curriculum	David Street, Department of Sociology University of Chicago
	Responses:	Walter Franke, Illinois William J. Schill, Illinois Rutherford Lockette, Trenton State College Trenton, New Jersey

1:30	Chairman	Alfred Krebs University of Illinois
	Criterion Problems and Curriculum Evaluation	Donald Leton Bureau of Educational Research University of Hawaii
	Responses:	Harry Anderson, College of Education University of Georgia
		Ralph Mason, School of Business Indiana State University
		Robert Wasson, College of Education University of Iowa

Wednesday, May 18

8:30	Chairman	Robert Campbell University of Illinois
	Psychological Aspect of Curriculum Evaluation	David Ausubel, College of Education University of Illinois
	Responses:	Robert Tomlinson, College of Education University of Illinois
		Richard Salinger University of Illinois
		Barbara Rosenquist System Development Corporation Santa Monica, California
1:30	Chairman	Jacob Stern, College of Education University of Illinois
	The Countenance of Educational Evaluation	Robert Stake, College of Education University of Illinois
	Responses:	J. Thomas Hastings Bureau of Educational Research University of Illinois
		Philip Tiemann Office of Instructional Resources University of Illinois
		Robert A. Campbell, College of Education University of Illinois

Thursday, May 19

8:30	Chairman	Robert Tomlinson, College of Education University of Illinois
	Evaluation Problems of the UICSM Curriculum Project	John Easley, Jr. College of Education University of Illinois

	Responses:	Richard Spencer Office of Instructional Resources University of Illinois
1:30	Chairman	Jerry Dobrovolny Department of General Engineering University of Illinois
	Administrative Aspects of Curriculum Evaluation	James Lipham, School of Education University of Wisconsin
	Responses:	Arthur McBeath University of Illinois

Friday, May 20

9:00	Chairman	William J. Schill University of Illinois
	Seminar summary and a charge to the participants	
10:00	Seminar evaluation	Charles W. Hill, Project Director

Participants

Margaret V. Barkley
Walter A. Bialobrzeski
Harold M. Byram
Edgar E. Clanin
Aleene Cross
Gene L. Dahlin
William E. Drake
Charles C. Drawbaugh
Vivien K. Ely
Nevin R. Frantz
Donald G. Green
James W. Hensel
James H. Hutchinson
Joseph T. Impelletteri
Mildred B. Johnson
Allen Kelsey
Elizabeth E. Kerr
Earl E. Knebel
Louise Lemon
Rutherford E. Lockette
Phyllis K. Lowe
W. Howard Martin
Ralph E. Mason
John D. Mattingly
Clarence Maze, Jr.
Marie P. Meyer
Warren G. Meyer
Jerome Moss, Jr.
Helen Nelson
Wilmot F. Oliver
Elizabeth Ray
Agnes F. Ridley
Lucy Robinson
John H. Rodgers
Howard Rosenwinkel
Glenn Z. Stevens
Ben S. Vineyard

Mary Lee Hurt
Earl M. Bowler

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OFFICE OF EDUCATION
WASHINGTON 25, D.C.

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Hill, Charles W. and Towne, Douglas C.

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Hill, Charles W. and Towne, Douglas C.

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15. ABSTRACT *(250 words max.)*

The purpose of this project was to develop further research knowledge, competencies and interests of individuals engaged in, or soon to become involved in research in vocational education. Personnel in state departments of education and universities made application to attend one of six one-week research seminars; a committee selected the individuals for each seminar.

The seminars were conducted in six universities on these problem areas: Development and Coordination of Research by State RCU's, Curriculum Development, Tests and Measurement, Occupational Mobility and Migration, Research Design and Curriculum Evaluation.

A total of 244 participants from state departments of education and universities and 14 from the U.S. Office of Education attended the seminars. The seminar director in each university engaged consultants, nationally known, who could make a significant contribution.

A high percentage of the consultants prepared papers that were distributed to participants. Three seminar directors published reports the titles of which are: "Research Development and Coordination," The Center for Vocational and Technical Education, Columbus, Ohio; "National Seminar on Curriculum Development," University of Georgia, Athens, Georgia and "Occupational Mobility and Migration - Proceedings of a Vocational Education Research Seminar," North Carolina State University, Raleigh, North Carolina.

The seminars and participants were evaluated on the degree of satisfactions, gain in knowledge, change in attitudes and orientation to basic and applied research. The findings in the evaluations and observations of the Project Director support the continuation of the research seminars for vocational educators.

16. RETRIEVAL TERMS *(Continue on reverse)*

Development of research competencies
State Research Coordinating Units
Curriculum development in vocational education
Occupational education
Curriculum evaluation in vocational education
Satisfactions with research
Attitudes toward research
Orientation to basic and applied research

17. IDENTIFIERS

Research seminars for vocational educators
Evaluation of seminars
Seminar consultants
Research seminars conducted by universities
Participants in seminars

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Include the type of report (whether proposal, in-progress, final, follow-up) as an added entry following the project number, where applicable. Following the type of report, enter the inclusive dates covered by the report, by month and year. (Example: 1/63 - 7/65.)

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